



Tronox LLC

DuPage County, Illinois

Final Completion Report – Reach 5A

for the

Kress Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site

June 2008

Certification

To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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Final Completion Report – Reach 5A for the Kress Creek/ West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site

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Acronyms and Abbreviations

ACAR Audit Corrective Action Report BBL Blasland, Bouck & Lee, Inc.

BOL Bill of Lading

C Coefficient of Conservatism
CAR Corrective Action Report

CBB West Christopher B. Burke Engineering West, Ltd.

CD Federal Consent Decree between Kerr-McGee and the United

States of America, State of Illinois

CFR Code of Federal Regulations

CMRDP Conceptual Mitigation and Restoration Design Plan

CQAP Construction Quality Assurance Plan

FD/RA Final Design/Remedial Action

FQI Floristic Quality Index
GPS Global Positioning System
HASP Health and Safety Plan

IEMA/DNS Illinois Emergency Management Agency/Division of Nuclear Safety

ICN Interim Change Notice
NCR Non-Conformity Report

QAPP Quality Assurance Project Plan

QA quality assurance

QA/QC Quality Assurance/Quality Control

RCs relative coverage
REF Rare Earths Facility
RFs relative frequency

RIV_n relative importance value

RPM/OSC remedial project manager/on-scene coordinator

SOW Statement of Work
STP Sewage Treatment Plant

TMSP Targeted Material Stabilization Plan

Tronox LLC, formerly known and referred to as Kerr-McGee

Chemical LLC [Kerr-McGee]

USEPA United States Environmental Protection Agency

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1. Introduction

This Final Completion Report has been prepared by ARCADIS (formerly known as Blasland, Bouck & Lee, Inc.) on behalf of Tronox LLC (Tronox; formerly known and referred to as Kerr-McGee Chemical LLC [Kerr-McGee]), to summarize the remedial action, restoration, and monitoring of restoration and mitigation areas performed in Reach 5A (which includes removal areas identified as R5A-1 through R5A-15) at the Kress Creek/West Branch DuPage River NPL Site (Kress Creek Site) and the River Portion of the Sewage Treatment Plant Site (STP Site), collectively referred to as the Sites, both located in DuPage County, Illinois. A final summary of the final results from the restoration/mitigation monitoring performed for Reach 5A in 2007 were submitted under separate cover (as described in Section 8.3).

1.1 Background

Historical operations at the West Chicago Rare Earths Facility (REF), where thorium and other elements were extracted from monazite sands, bastnasite, and other ores between 1932 and 1973, and the STP, which received debris and waste from the REF, resulted in the distribution of low level radioactive thorium residuals in portions of Kress Creek, the West Branch DuPage River, and their associated floodplains.

Extensive site characterization was performed to delineate areas at the Sites with radioactivity levels of thorium residuals (BBL, 2004). A site remedy (Remedial Action) was developed based on the site investigation findings and the baseline human health and ecological risk assessments performed by the United States Environmental Protection Agency (USEPA). The Remedial Action was designed to be consistent with the requirements set forth in 40 Code of Federal Regulations (CFR) Part 192 in implementing the Uranium Mill Tailings Radiation Control Act and the Illinois Source Material Milling Facility Licensing Regulations under Title 32 of the Illinois Administrative Code Part 332.

The selected remedial activities to be implemented at the Sites is based upon an extraordinarily extensive level of characterization activities and lengthy and detailed dialogue among Tronox, USEPA, and representatives of the Local Communities, including the City of West Chicago, West Chicago Park District, DuPage County, the DuPage County Forest Preserve District, and the City of Warrenville. This characterization defined the limits of excavation of targeted materials to assure protection of human health and the environment.

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Specifically, the remedial activities in Reach 5A presented in this report were conducted to achieve the performance standards and other requirements as specified in the Federal Consent Decree (CD) and attached Statement of Work (SOW; USEPA, entered on August 10, 2005), and the Local Communities Consent Decree (entered on April 20, 2005).

The Remedial Action activities for the land-based portions of Reach 5A were performed in accordance with the *Final Design/Remedial Action Work Plan – Reach 5A (Areas R5A-1, R5A-3, R5A-4, R5A-8, R5A-10, and R5A-11) for the Kress Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site (BBL, 2005a).* The Remedial Action activities for the river portions of Reach 5A were performed in accordance with the *Final Design/Remedial Action Work Plan – Reach 5A for the Kress Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site (BBL, 2005b).*

1.2 Reach 5A Description

Reach 5A extends approximately 3,000 feet along the West Branch of the DuPage River from just upstream of the City of West Chicago Sewage Treatment Plant (STP) outfall to Gary's Mill Road in DuPage County, Illinois. A site location map is provided in Figure 1-1. The western bank adjacent to the STP facility is owned by the City of West Chicago and the DuPage County Forest Preserve District and the east bank is owned by private residents. There are several commercial properties and a church along the west side of the DuPage River between Route 38 and Gary's Mill Road, and a number of commercial properties and an apartment complex on the east side of the river south of Route 38.

1.3 Performance Standards

The performance standards for the remedial actions are as follows:

1. Removal of Material to Pre-Determined Elevations

Tronox shall remove targeted soils and sediment from the Sites to pre-determined Global Positioning System (GPS) survey points in accordance with the RODs (STP Record of Decision (ROD) finalized September 30, 2004 [USEPA, 2004]; Kress Creek ROD finalized March 24, 2005 [USEPA, 2005]). The pre-determined points for the areas within Reach 5A are presented in Appendix A-2: Excavation Verification Plan.



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2. Restoration and Mitigation Activities

Tronox shall restore and mitigate impacted areas and perform monitoring and maintenance activities in accordance with the *Conceptual Mitigation and Restoration Design Plan* (BBL, 2005c) and as outlined in Section 3.1.5 of the Reach 5A FD/RA Work Plans (BBL, 2005a and 2005b).

2.1 Report Organization

This report was prepared in accordance with the requirements in Section 4.3 Final Completion Report(s) of the CD (Appendix K, Statement of Work), and describes the Remedial Action construction and restoration activities including the following sections:

- Section 1 Introduction
- Section 2 Remedial Action
- Section 3 Design Deviations
- Section 4 Quality Assurance and Quality Control
- Section 5 Record Drawings
- Section 6 Representative Project Photographs
- Section 7 Records of Removal Quantities and Off-Site Waste Disposal
- Section 8 Monitoring of Restoration/Mitigation Areas
- Section 9 References

2.2 Document Control

The project records (Documents) required by the CD for the subject remedial action have been prepared and are maintained in the file room at the Tronox offices located at the REF, in the custody of Tronox's Document Control Group. Records are periodically transferred to Tronox's records management center in Oklahoma City, Oklahoma.

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A copy of Tronox's project file index can be found in Appendix A. These Documents shall remain on file in accordance with the CD pursuant to the requirements of USEPA. At the end of the required retention time, USEPA will be notified at least 90 days prior to document destruction and will be given the opportunity to assume custody of the Documents if requested.

2.3 Good Faith Estimate of Total Costs Incurred

Tronox estimates that the total cost for completing Reach 5A Remedial Action is approximately \$3,619,397. This good faith cost estimate for Reach 5A is based on the primary remedial construction activities that occurred in Reach 5A from November 1, 2004 to July 31, 2005.



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3. Remedial Action

This section summarizes the major tasks of the Remedial Action and presents a chronological description of major Remedial Action activities performed in Reach 5A.

3.1 General

In September 2003, Tronox retained ARCADIS to implement the Remedial Action at the Sites. The remedial action consisted of excavation of "targeted materials", as defined in the CD, and site restoration. A series of verification points were established that defined the horizontal locations and vertical elevations of excavation limits. These predetermined verification points along with other remedial design criteria were adhered to during the Remedial Action to monitor the work performance. Any deviations from the design submittals are discussed in Section 3 of this report.

In addition to the FD/RA Work Plans, a number of relevant project documents have been prepared and followed during the implementation of the Remedial Action construction, restoration, and monitoring. Below is a list of these documents:

- Conceptual Mitigation and Restoration Design Plan (BBL, 2005c)
- Common Scoping and Planning Documents (BBL, 2005d)
 - Document 200: Quality Assurance Project Plan (QAPP)
 - Document 300: Construction Quality Assurance Plan (CQAP)
 - Documents 400 and 401: Health and Safety Plans (HASPs)
 - Document 500: Emergency Contingency Plan
 - Document 600: Dust Control Plan
 - Document 700: Air Monitoring Plan
 - Document 800: Global Positioning System Verification Plan
 - Document 900: Targeted Material Stabilization Plan

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3.2 Description of Remedial Action Activities

Tronox, through its own personnel and qualified contractors, completed remedial activities at Reach 5A in two phases, land-based portions (November and December 2004) and river portions (between July 2005 and August 2006). The Remedial Action consisted of five major tasks. These major tasks and a description of some typical activities performed under each task are as follows:

- Site Preparation Activities performed prior to excavation including utilities clearance, setup of temporary construction facilities, work force mobilization, and installation of erosion and sedimentation controls, haul roads, staging areas, and river water diversion measures.
- Overburden Removal and Verification This included excavation of overburden material, excavation limits verification using survey grade GPS and Total Station Land Surveying Equipment, verification sampling of overburden material for reuse using gamma ray survey technology by a field health physics technician followed by composite soil sampling and analysis, and stockpiling of overburden for reuse.
- Excavation and Offsite Disposal of Targeted Materials This included removal of targeted materials to predetermined verification points, verification of excavation limits using survey grade GPS and Total Station Land Surveying Equipment, and direct loading or stockpiling/loading and transport of excavated targeted materials to the REF located in West Chicago, Illinois for subsequent offsite transportation (via rail) and disposal in Utah..
- Excavation Verification This included GPS survey verification of excavation depths in accordance with the GPS Verification Plan (Document 800), comparison of as-built excavation data to the verification points, preparation of GPS verification packages, and notification to USEPA remedial project manager/on-scene coordinator (RPM/OSC), Illinois Emergency Management Agency/Division of Nuclear Safety (IEMA/DNS), and Local Communities Representatives of verification results.
- Restoration Activities to restore the site for beneficial use including backfilling, topsoil placement and seeding, installation of erosion control measures, planting of trees, shrubs, and aquatic plants, and other riverbank restoration elements.



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3.3 Chronological Narrative of Remedial Activities Performed

Pre-Construction Activities

The following steps were completed prior to the beginning of the excavation and restoration activities for Reach 5A:

- On October 28, 2004, USEPA issued a conditional approval for the Scoping and Planning Documents and Final Design/Remedial Action (FD/RA) Work Plan for the land-based portions of Reach 5A (Sections R5A-1, R5A-3, R5A-4, R5A-8, R5A-10, and R5A-11), which authorized Tronox to begin construction activity on November 1, 2004.
- On October 29, 2004, a pre-construction meeting was held for the remedial work in the land-based portion of Reach 5A, and was attended by Tronox, ARCADIS, the regulating agencies (i.e., USEPA, USEPA RPM/OSC, IEMA/DNS, and City of West Chicago), and the Local Community representatives (i.e., Christopher B. Burke Engineering West, Ltd. [CBB West]).
- On November 3, 2004, USEPA approved the restoration details for Sections R5A-8 and R5A-10.
- On June 9, 2005, USEPA approved the FD/RA Work Plan for the land-based portions of Reach 5A.
- On June 17, 2005, USEPA approved the FD/RA Work Plan for the river portions of Reach 5A.
- On June 23, 2005, a pre-construction meeting was held for the remedial work in the river portion of Reach 5A, and was attended by Tronox, ARCADIS, the regulating agencies, and the Local Community representatives.
- Prior to use, the source of borrow soil to be used as backfill was identified and the
 potential borrow soil was tested to verify that it had met the project criteria for
 backfill. Testing results of borrow soil are provided in Appendix L and are kept on
 file at the REF in West Chicago, Illinois.

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USEPA, IEMA/DNS, the City of West Chicago and the Local Communities
Representative were notified in advance of the Tronox's intent to perform GPS
Verification Survey on a weekly basis.

Remedial Action Activities

A chronological description for remedial activities performed at Reach 5A are presented below:

- Labor, equipment, and materials necessary for the work were mobilized to Reach
 5A in October 2004.
- Site areas were prepared including, but not limited to, utility clearance, construction
 of support/staging areas and haul roads, installation of temporary diversion and
 erosion control measures, and establishing site access control points.
- Overburden removal was completed in November 2004 for Reach 5A removal areas R5A-1, R5A-3, R5A-4, R5A-8, R5A-10, and R5A-11. Overburden removal in Reach 5A removal areas R5A-2, R5A-5, R5A-6, R5A-7, R5A-9, R5A-12, R5A-13, R5A-14, and R5A-15 was completed in July 2005. Radiological sampling of the overburden material was completed. Results are summarized in Appendix K and are kept on file at the REF in West Chicago, Illinois.
- Field verification of overburden excavation limits for all of Reach 5A was completed in July 2005 with survey grade GPS and Total Station Land Surveying Equipment to demonstrate that the performance standards for overburden segregation were met. Verification results of overburden bottom were prepared and distributed as each Reach 5A area (e.g., R5A-2) was completed. A list of GPS verification survey reports is provided in Appendix B. Through the distribution of GPS packages, the regulatory agencies and Local Community representatives were notified of the results of the GPS Verification Survey for the bottom of overburden.
- Excavation of targeted materials was performed in November 2004 in Reach 5A removal areas R5A-1, R5A-3, R5A-4, R5A-8, R5A-10, and R5A-11 using conventional excavating equipment to pre-determined verification points.
 Excavation of targeted materials in Reach 5A removal areas R5A-2, R5A-5, R5A-6, R5A-7, R5A-9, R5A-12, R5A-13, R5A-14, and R5A-15 was performed in July and August 2005. Verification results of targeted material bottom were prepared and distributed as each Reach 5A removal area (e.g., R5A-2) was completed. A

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list of verification data reports is provided in Appendix C. Through the distribution of GPS packages, the regulatory agencies and Local Community representatives were notified of the results of the GPS Verification Survey for the bottom of targeted material.

- The last GPS verification packages for the excavation of overburden and targeted materials for Reach 5A were completed and distributed on August 2 and 5, 2005, respectively. A comprehensive summary of all Reach 5A GPS verification point tables for the bottoms of overburden and targeted material are provided in Appendices D and E, respectively. The comprehensive GPS verification points figures for the bottoms of overburden and targeted material are provided in Appendices F and G, respectively.
- Air quality was monitored during the excavation of overburden and targeted materials, and the air monitoring data were summarized each month and included in the monthly progress reports that were distributed by Tronox to the regulating agencies and local community representatives.
- Excavated soils and other materials (e.g., roots, tree stumps) containing targeted
 material were transported to the REF where they were managed under the
 IEMA/DNS Radioactive Material License #STA-583 and subsequently loaded on
 railcars and transported under the Tronox LLC US DOT Exemption #DOT-E-11075
 to the Energy Solutions Facility (State of Utah 11e.(2) By Product Materials
 License #UT2300478) for final disposal.
- During the river portion of remedial activities in Reach 5A, water column monitoring
 was performed upstream and downstream of active remedial areas on a daily
 basis during in-river activities to identify and respond to potential water column
 impacts, if necessary. The monitoring data were compiled and summaries are
 provided in Appendix J.
- Removal areas were backfilled, except areas R5A-7 and R5A-13 which were instream sections that did not require backfilling, with approved overburden and imported backfill materials in accordance with the FD/RA Work Plans. For removal area R5A-15, which was an in-river location, the excavated area was backfilled with wetland topsoil. An area adjacent to removal area R5A-15 and in the river but closer to the shoreline was also excavated as an interim source for wetland topsoil for removal area R5A-15. This removal area was also subsequently backfilled with wetland topsoil.

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- In December 2004 and August 2005, restoration was performed on the land-based portion of Reach 5A (removal areas R5A-1, R5A-3, R5A-4, R5A-8, R5A-10, and R5A-11), and the river portion of Reach 5A (removal areas R5A-1, R5A-3, R5A-4, R5A-8, R5A-10, and R5A-11) that were disturbed by the project. Restoration activities including backfilling, final grading, placing of river rocks on the banks, seeding and installation of erosion control blankets were performed in accordance with the FD/RA Work Plans and the Conceptual Mitigation and Restoration Plan (BBL, 2005a, 2005b and 2005c).
- On August 6, 2005 the reshaping of hummocks and hollows in Reach 5A Area R5A-11 was performed under the direction of CBB West.
- In winter 2005, herbicides were applied in some areas of Reach 5A to treat the reed canary grass, Canada thistle and teasel weeds and live stakes (Salix Discolor, Willow) were installed.
- Replacement trees and shrubs were planted in May and June 2006. Protective fencing was installed around the new replacement trees to protect against beaver and deer activities.
- On August 8, 2006 a final site inspection for the completion of the remedial construction activities through the seeding and planting of replacement of trees and shrubs in Reach 5A was performed with regulatory agencies, local community representatives, Tronox, and ARCADIS in attendance. Five punch-list items were identified and were subsequently completed by August 11, 2006.
- On August 14, 2006 ARCADIS issued an e-mail to the regulating agencies noting that as of August 11, 2006 all of the punch list items for Reach 5A were completed.
- On December 13, 2006 ARCADIS formally issued the Post-Construction
 Inspection Report for Reach 5A to the regulating agencies and made reference to
 the ARCADIS August 14, 2006 e-mail. In the Post-Construction Inspection Report,
 it was noted that all the remedial construction and restoration work items for Reach
 5A, including the punch list items generated during the August 8, 2006 final site
 inspection, were completed on August 11, 2006.
- The mitigation and restoration monitoring activities began on August 11, 2006 for Reach 5A.

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- In response to ARCADIS' December 13, 2006 Post-Construction Inspection Report for Reach 5A, on April 17, 2007, USEPA issued an e-mail stating that the mitigation and restoration monitoring period for Reach 5A began on August 11, 2006.
- In May 2007, additional river rock was installed along portions of restored bank in removal areas R5A-1, R5A-9, and R5A-12 to bring the rock up to the ordinary high water elevation, as designed.

3.4 Backfill Materials

Two primary types of materials were used as backfill for site restoration in Reach 5A, overburden material and imported material.

Overburden Material Used as Backfill

Overburden soil was stockpiled at dedicated staging areas for subsequent gamma survey and sampling to demonstrate that the material did not exceed the approved cleanup criterion. Following the survey and soil sampling USEPA and IEMA/DNS representatives performed an independent survey of the stockpiled materials prior to their approval of the use of overburden as backfill. Overburden testing results are provided in Appendix K and are on file at the REF. Approximately 1,137 loose cubic yards of overburden were generated and reused to backfill Reach 5A.

Imported Backfill and Other Materials for Site Restoration

Off-site borrow soil sources and other materials such as rip rap were identified and tested prior to being imported to the Sites for use in accordance with Document 200. The material sampling data are provided in Appendix L. The source of the earth fill, clay, and topsoil was Art Lootens and Son, Inc. facility, located at 0S551 Joliet Road, West Chicago, Illinois 60185. The source for river rock fill is Earth Inc. located at 455 West Bartlett Road, Bartlett, Illinois 60103. The source for the rip rap used for river bank restoration was Conco-Western Stone Company on Route 25 in North Aurora, Illinois 60542.

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4. Design Deviations

This section describes any deviations from design submittals associated with the Reach 5A FD/RA Work Plans and the Common Scoping and Planning Documents during the implementation of the remedial action. Deviations are documented in three types of project documents, Non-Conformity Reports (NCRs), Corrective Action Reports (CARs), and Interim Change Notices (ICNs). In addition, quality system audits are performed periodically. Audit findings are documented as audit corrective action reports (ACARs), and the ACARs are classified as either a major or minor finding.

Non-Conformity Reports

There were no NCRs issued for the remedial work performed to implement the Reach 5A FD/RA Work Plans.

Corrective Action Reports

There were no CARs issued for the remedial work performed to implement the Reach 5A FD/RA Work Plans.

Audit Corrective Action Reports

There were two ACARs issued for the remedial work performed to implement the Reach 5A FD/RA Work Plans. A brief summary of each ACAR is provided below:

- CAR No. 05-VA-04-05 was issued on October 21, 2005 to document a corrective
 action taken in response to a Tronox quality control vendor audit minor finding, i.e.,
 three (3) verification points were not labeled on the verification map of the GPS
 Verification for Bottom of Overburden Package # KC-027A. A corrective action
 was completed on April 11, 2006 to provide a revised figure to the regulatory
 agencies with labels identifying the three points.
- CAR No. 06-VA-04-01 was issued on November 10, 2006 to document a
 corrective action taken in response to quality control audit findings, i.e., the formal
 Post-construction Inspection Report was not issued in a timely manner nor was the
 inspection event reflected in the schedule as a milestone item, and no
 procedures/requirements were in place for the implementation of mitigation and
 restoration monitoring. Corrective actions were completed by December 14, 2006
 which include the issuance of the formal Post-Construction Inspection Report was

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not issued in a timely manner nor was the inspection event reflected in the schedule as a milestone item,. Corrective actions were completed by December 13, 2006 which included the issuance of the formal Post-Construction Inspection Report for Reach 5A and preparation of a draft checklist and schedule to track the implementation of the restoration maintenance and monitoring activities.

Interim Change Notices

There were no ICNs issued for the remedial work performed to implement the Reach 5A FD/RA Work Plans.

There were instances where the Work Plan details were slightly modified in the field to adjust to field conditions or to adopt better construction practices. These modifications have been documented in the record drawings. Examples of these field modifications that were implemented are:

- The location of the access roads and staging areas were modified in part to
 position the roads on as level a grade as possible, and as close as possible to
 access the excavation and staging areas.
- The final grading plan for the hummock and hollow area in removal area R5A-11 was coordinated in the field with the Local Communities Representative.
- The limits of disturbance were modified as necessary and as field conditions
 permitted to reduce the impact to the existing properties. For example, access
 roads were not installed to access removal areas R5A-12, R5A-13, R5A-14 and
 R5A-15 because the grass areas were sufficiently dry and hard to support the
 construction equipment, and this resulted in substantially less impact to the lawns
 in those areas.
- Based on input received from private property owners and the Local Communities representative, the location and type of tree and shrub plantings were modified once ARCADIS approved the proposed changes.
- As noted in the cover letter dated 11/18/04 of the Notification of Successful GPS
 Verification Survey for the Bottom of Potential Byproduct Material in Reach 5A –
 Section R5A-1, a field modification was implemented to address the area where 10
 potential byproduct material design points were impacted by construction activities.
 The letter specifically stated:

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In the northeast corner of Section R5A-11, there were 5 Drillhole Excavation Verification Points (12166, 12169, 12170, 12175 and 12176) and five Boundary Excavation Verification Points (B4, B7, B9, B11 and B12) that were excavated below the accepted tolerance of 0.16 feet below the design elevation for bottom of potential byproduct material. This over excavation was due to the fact that the backhoe excavator's tracks sank into the moist, soft soils in the area during excavation of the potential byproduct material, even though timber mats were used to support the backhoe. To remove soils that may have been pushed below the original design bottom of potential byproduct material, it was agreed on November 16 and 17, 2004 by Steve Shafer of IEMA/DNS (REM), Matt Scheffler of CBB West and ARCADIS that the adjusted lower elevations for bottom of potential byproduct material would resolve the issue.

At the time when removal area R5A-15 was excavated and ready for backfill, a supply of acceptable wetland topsoil had not been obtained, and the long-stick excavator backhoe that was required to reach the excavation area was scheduled to leave the construction site. Therefore as an interim step, in an area in the same backwater area and closer to the western riverbank that could later be reached by a standard backhoe excavator, the surface wetland topsoil from that shoreline area was excavated and placed as backfill in removal area R5A-15. When wetland topsoil from DuPage County Technical Park was subsequently approved for use by CBB West, the excavated area nearer the shoreline was then backfilled. In accordance with the restoration plan for removal area R5A-15, both removal area R5A-15 and the interim shoreline excavation area were planted with aquatic plants. The record drawings will show the aquatic plantings in both of these areas.

Variations from the design coordinates and elevations of the drillholes and boundary points were recorded in Appendices D and E (the Comprehensive GPS Verification Tables for Bottom of Overburden and Bottom of Targeted Material, respectively) and Appendices F and G (GPS Verification Points Figures for Bottom of Overburden and Bottom of Targeted Material, respectively). In all cases all of the targeted material was excavated and removed.

In the tables in Appendices D and E, comments were noted for the points in areas where Tronox directed all of the overburden material to be excavated and handled as targeted material. This was done for reasons of cost effectiveness in areas with minimum thickness and/or volume of overburden material, or where deep roots prevented the easy separation of overburden from the underlying targeted material. It

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was also noted in the tables where over excavation of target material was performed to address equipment rutting in a few areas.

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5. Quality Assurance and Quality Control

The Remedial Action was performed under the auspices of an internally managed quality assurance (QA) program that was expressed in the form of a Quality Assurance Manual, which follows the international standard ISO 9000. The Quality Assurance Project Plan (QAPP; Document 200 of the Scoping and Planning Documents) was prepared in accordance with this manual. The QAPP was also prepared in accordance with USEPA QAPP guidance documents, in particular, the Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans (QAMS-005/80), and the Region V Model QAPP (1991).

The QAPP provided positive management control and included procedures and requirements to establish a record of conformance. This QAPP established standard operating procedures, change notices and field work instructions, and provided the operational and administrative requirements for the successful excavation and restoration of the Reach 5A areas. Within this system, individual and organizational responsibilities were assigned for the activities and control measures necessary to achieve, verify, and document conformance. Adherence to this program, approved procedures, and regulatory compliance requirements were mandatory for all Tronox, ARCADIS, and ARCADIS subcontracted employees.

The key project Quality Assurance and Quality Control (QA/QC) elements associated with the Remedial Action at Reach 5A are as follows:

- Health and Safety Work was consistently performed in a safe and healthy
 manner to protect site workers, residents from the surrounding community, and the
 environment by implementing best practices such as following HASP procedures,
 monitoring air quality, and controlling dust emission.
- Verification of Excavation Limits Excavation limits for the overburden segregation
 and targeted material removal were verified with GPS Verification Survey and
 documented in the Notification of Successful GPS Verification Survey packages
 that were distributed to the regulators and are on file in Tronox's file room at the
 REF.
- Material Sampling Overburden materials were sampled prior to reuse as backfill.
 Sources of borrow soil were tested before the soil was imported for site use. The documentation of the QA/QC testing is on file in Tronox's file room at the REF.

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 Mitigation and Restoration Monitoring – Upon the completion of the Remedial Action, monitoring activities are carried out to evaluate the performance of the restored site. Performance standards were set such that adaptive management measures would be implemented should any deficiency be identified during the monitoring activities.

The results of the QA/QC activities are presented in appropriate project submittals or project files including GPS Verification Survey packages (Appendices B through E), Health and Safety records (on file), air monitoring and dust monitoring results (on file), sampling results of borrow soil (Appendix L), water column monitoring data (Appendix J), and annual reports summarizing the monitoring of performance standards for mitigation and restored areas (starting in 2007).

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6. Record Drawings

The site final grading plan, vegetation restoration record drawings and other restoration elements associated with the Reach 5A Remedial Action are documented in construction record drawings provided in Appendix H. The record drawings were developed to reflect post-remediation conditions using the reach-specific design drawings as a base. The Reach 5A seed mixes drawing (B-20) and the vegetation restoration record drawings (B-21 and B-22) are new drawings that have been prepared at the request of the Local Communities.



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7. Representative Project Photographs

Photographic documentation was performed during the project activities. Project photographs depicting the day's construction activities were included in the Quality Control Daily Reports that were compiled by ARCADIS. Representative project photographs highlighting the major construction activities in Reach 5A are provided in Appendix I.

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8. Records of Removal Quantities and Off-Site Waste Disposal

In general, during the Remedial Action at Reach 5A, two types of materials were removed, transported, and disposed off-site, including:

- Targeted material
- Non-targeted material that was not used as backfill

Descriptions of these removed materials and their management are presented below. Records for material shipping and disposal, including truck shipment Bills of Lading (BOL) and waste manifests, are kept on file at Tronox's file room located at the REF, and are available for inspection.

8.1 Targeted Material

A total volume of approximately 1,432 loose cubic yards of targeted material were loaded into covered trucks and transported to the REF dump pad from Reach 5A. This quantity was determined based on truck shipment Bill of Lading (BOL). This material consisted of targeted material and tarps and plastic liners used for the targeted material staging area. The soil at the dump pad was then moved to the REF direct load-out stockpile area where they were managed under the IEMA/DNS Radioactive Material License #STA-583. As each stockpile was created, it was sampled to verify radiological characteristics and moisture content, and was subsequently loaded into weighed gondola railcars. The loaded railcars were then transported under the Tronox LLC US DOT Exemption #DOT-E-11075, via train, to Energy Solutions' (formerly known as Envirocare of Utah Inc.) Clive Disposal Site (State of Utah - 11e.(2) By Product Materials License #UT2300478) for final disposal at:

Interstate 80, Exit 49 Clive, Utah 84029 Phone: (801) 532-1330

A total of 2,481 tons of material generated from Reach 5A Remedial Action were shipped and disposed of at Energy Solutions facility in Clive, Utah.

8.2 Non-Targeted Material Not Used as Backfill

There was not any non-targeted material that was not used for backfill. The excavated overburden material that passed the radiological scanning and sampling process

described in Section 2.2 was used for backfill in Reach 5A. Excavated overburden material that did not pass the radiological tests was treated as targeted material and transported to the REF for shipment by railcar to Utah for disposal.

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9. Monitoring of Restoration/Mitigation Areas

9.1 Introduction

Previous sections of this report summarized the remedial and restoration activities performed in Reach 5A, and Record Drawings (Appendix H) were prepared that document the locations that the various seed mixes were applied and the species and locations of planted trees and shrubs.

The 2007 Annual Monitoring Report contains the results of monitoring and maintenance activities conducted to evaluate the health and progress of seeded and planted vegetation, the stability of restored banks and in-stream habitat structures in the reach, and the development of upland and wetland habitats towards meeting vegetation performance standards. Subsequent annual reports will be issued for the length of the monitoring period for Reach 5A.

Monitoring of the restored banks and habitats is required by the Statement of Work attached to the CD. The monitoring requirements are consistent with the methodologies presented in the *Conceptual Mitigation and Restoration Design Plan (CMRDP)* (BBL, 2005c) and the Final Design/Remedial Action Work Plans – Reach 5A (BBL, 2005a and 2005b), which were reviewed and approved by the USEPA and representatives of the Local Communities. The final Reach 5A inspection and acceptance of the completed construction work by USEPA and the Local Communities occurred on August 11, 2006, at which time the monitoring period began.

Restored banks and vegetative communities are monitored annually during the spring and peak growing season (July/August) of each required monitoring year to evaluate stability and to collect quantitative vegetation data for comparison to performance standards. Table 8-1 summarizes the site-specific monitoring activities and performance standards for Reach 5A. Each required year of vegetation monitoring will terminate at the completion of the summer monitoring event. The first year of bank monitoring will terminate with the completion of an inspection 10 to 14 months after their construction. Subsequent annual bank monitoring events will occur 10 to 14 months after the previous monitoring event.

Bank stability monitoring is required to be performed for three years, with at least one event occurring after a storm that equals or exceeds the bankfull (approximately a 2-year recurrence frequency) discharge of 512 cubic feet per second (cfs) at the USGS gaging station on Kress Creek at the south end of Reach 3A (*Conceptual Design*

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Report, BBL, 2002). During bank inspection, restored banks will be inspected for signs of erosion that would jeopardize the integrity of the bank. The limits of a "bank" extend from the toe of slope to the first observable break in slope. Signs of significant erosion include toe erosion causing undercutting, lateral erosion above the rock protection, exposed geotextile fabric, or vertical erosion down the face of the bank from overland flow entering the river. Stability will be evaluated by visual observation and comparison to design drawings, considering location in the stream, physical dimensions, and designed hydraulics. Bank areas found to be significantly eroding will be repaired in accordance with a maintenance activity design report that will be generated prior to the initiation of any major maintenance activity.

9.2 Qualitative Spring Inspection

Qualitative inspections of restored areas, consisting of visual inspection of restored banks and habitats in Reach 5A are performed in the spring of each year, but may also occur throughout the year to evaluate stability and vegetation status and to determine if any maintenance activities are required to meet performance standards. Observations made during qualitative inspections will be photo documented as field conditions permit (e.g., low enough water levels to observe banks and structures).

Activities to be conducted during the summer monitoring event are described below.

9.3 Quantitative Summer Monitoring Event

The status of the restored banks and habitats of Reach 5A will be evaluated during the summer inspection with regard to their ability to meet specific performance standards. The quantitative summer inspection will occur in July or August and will consist of herbaceous vegetation data collection, assessment of the health of planted trees and shrubs, and photo-documenting the development of restored areas over time. Table 8-1 summarizes the data collection requirements and performance standards for the quantitative monitoring efforts. Details of the components of the summer monitoring effort are provided in the following sections.

9.3.1 Herbaceous Vegetation Monitoring

The vegetation of restored banks and upland and wetland habitats will be monitored to document the progress of the vegetation development towards the vegetation performance standards of 85% ground cover in uplands, 90% cover in wetlands, less than 15% cover by invasive species in restored bank areas, and less than 5% invasive

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species in uplands (Table 8-1). Invasive upland species include, but are not limited to: *Phragmites australis* (common reed), *Poa compressa* (annual blue grass), *Poa pratensis* (Kentucky blue grass), smooth brome (*Bromus inermis*), tall fescue (*Festuca elator*), quack grass (*Agropyron repens*), *Salix interior* (sandbar willow), *Rhamnus cathartica* (common buckthorn), *Rhamnus frangula* (glossy buckthorn), *Lonicera spp.* (honeysuckle), and *Phalaris arundinacea* (reed canary grass).

Monitoring of herbaceous vegetation will utilize 1-square meter sample plots located randomly in restored vegetation areas. The numbers of plots that will be utilized in each restoration area are presented in Table 8-1. The random plot locations will be identified prior to entering the field using a random number generating program to select gridline intersections of a grid superimposed over the site. In the field, data collected from each plot will consist of the visually estimated percent ground cover, the identification of all plant species present in the plot, and the visually estimated percent cover of each species in the plot. The percent ground cover of a restoration area will be represented by the average percent cover values observed in all plots in that restoration area. The average percent ground cover will be compared to the site-specific performance standard presented in Table 8-1 to determine if the performance standard is met or if repairs are required to meet the performance standard by the third growing season. Corrective actions will be performed in accordance with a maintenance activity design report that will be generated prior to the initiation of any major maintenance activity or repair.

The following additional herbaceous vegetation-related performances standards apply to vegetation of uplands on Forest Preserve and government-owned property, and all restored and created wetland areas:

- At least 90% of exposed areas will be vegetated by the end of the first three growing-season months (i.e., after July 1).
- By the end of the third full year after planting no area over the entire vegetated restoration area greater than 0.5 square meters should be devoid of vegetation.
- The relative importance value of total native plants (RIV_n) shall increase from the end of the first full growing season to the end of the third full growing season after planting. The RIV_n is calculated by first calculating relative frequency (RF_s) and relative coverage (RC_s) of each species in each quadrat. RF is the measure of the level of occurrence of a single species in a given plant community. RC is the percentage of area occupied by a single species in a given plant community where

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the sum of the species' cover in that community equals 100%. The relative importance value (RIV_s) of each native species is then calculated by the equation:

$$\frac{RF_s + RC_s}{2 \times 100} = RIV_s$$

- A native mean Coefficient of Conservatism value or C (native mean C value) of greater than or equal to 3.5 shall be achieved for the entire restoration area by the end of the third year after planting. The C value is the measure of native plant community quality established by Swink and Wilhelm (1994). A Floristic Quality Index (FQI), which is a plant community measure of the C value, will also be calculated by multiplying the C value by the square root of the number of native species. The C value and FQI must increase from the first to the third year after planting.
- If the native mean C value, native FQI and/or RIV_n have not increased from the first to the third growing season; appropriate corrective actions will be taken to achieve the restoration intent of the design.
- By the end of the third full year after planting, none of the three most dominant plant species in the restoration areas may be non-native species or weedy species including: Cattail (*Typha spp.*), Common Reed (*Phragmites australis*), Annual Blue Grass (*Poa compressa*), Kentucky Blue Grass, (*Poa pratensis*), Purple Loosestrife (*Lythrum salicaria*), Sandbar Willow (*Salix interior*), Barnyard Grass (*Echinochloa crusgalli*), Common buckthorn (*Rhamnus cathartica*), Glossy Buckthorn (*Rhamnus frangula*), Honeysuckle (*Lonicera spp.*) or Reed Canary Grass (*Phalaris arundinacea*).

Vegetation metrics related to percent cover will be calculated from the vegetation plot data. Species-specific data collected from the vegetation plots will be utilized to calculate the Mean C value, FQI and RIV $_n$ metrics, where required, for evaluation against performance standards for these metrics that require an increase in each metric from the first growing season to the end of the third growing season. The performance standard requiring no areas larger than 0.5 square meters to be devoid of vegetation will be evaluated based on a site walkover specifically for that purpose. Areas greater than 0.5 square meters in size will be noted and corrective actions will be performed in accordance with a maintenance activity design report that will be generated prior to the initiation of any major maintenance activity.

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9.3.2 Tree and Shrub Survival Monitoring

The performance standard for tree and shrub survival in restored areas is 90% survival. The Record Drawings presented in Appendix H show the locations of the new trees and shrubs planted in Reach 5A as part of the restoration effort. These Record Drawings reflect any revisions made since approval of the FD/RA Work Plans related to landowner and Local Community representative input, or changes in the actual limits of disturbance from the limits anticipated at the time of plan preparation. Specifically, the locations and numbers of shrubs along restored banks were moved higher on the bank in response to property owner request to enable them to be seen from the Sewage Treatment Plant. As a result, several trees and shrubs were not planted directly in the restored removal areas. In addition, trees were substituted for shrubs, and additional trees were planted along R5A-11 to screen the view of the Sewage Treatment Plant by the landowner on the opposite side of the river. And lastly, the extension of the parking lot on the church property adjacent to R5A-14 using gravel placed to create temporary access roads was not performed because temporary access roads were not constructed at that location.

Trees and shrubs were planted on Forest Preserve Property based on the actual limits of disturbance. A memo summarizing the area of Forest Preserve property disturbed was submitted to CBB West on February 11, 2008. The figure depicting the area of disturbance to Forest Preserve Property in Reach 5A is included in Appendix M.

The Record Drawings provide the baseline numbers of trees and shrubs for assessment of tree and shrub survival. Due to the relatively low number of trees and shrubs planted in Reach 5A, the percent tree and shrub survival will be based on visual assessment of the health of all planted trees and shrubs. Individual counts are more efficient and more accurate in small areas with few plantings than the sub-sampling quadrat method originally proposed in the CMRDP.

Surviving trees and shrubs should exhibit healthy and abundant leaves, live buds, vertical orientation, no exposed roots, and green inner bark. Naturally recruited non-invasive tree and shrub species that are observed in restoration areas will be included in tree and shrub counts. The number of surviving and recruited tree and shrubs in the reach will be divided by the number of trees and shrubs originally planted in the reach to calculate the percent survival in Reach 5A. Areas that will not meet the 90% survival performance standard by the third monitoring event will receive supplemental plantings in accordance with a maintenance activity report that will be generated prior to the initiation of any major maintenance activity.

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9.3.3 In-Stream Structure Monitoring

No in-stream structures were installed in Reach 5A; therefore no in-stream structure monitoring will be performed.

9.3.4 Photo Documentation

Photographs will be taken of restored areas to document observations and to provide a record of vegetation development over time. Permanent photograph locations will be established in the field that provide a general overview of each restored bank, vegetative community, and constructed structure. A labeled wooden stake will be installed at each photo location and its location will be instrument surveyed so it can be reproduced for subsequent monitoring events if the stake is removed or lost. Photographs with captions describing the location and direction of photograph will be provided in the appendices of the annual monitoring report.

9.4 Report Preparation

A monitoring report will be prepared each year of the required monitoring period. The first annual monitoring report for Reach 5A was issued in January 2008 following the 2007 growing season. The monitoring report summarizes the observations during the field monitoring activities, presents data tables with the required vegetation metrics calculations, and provides photographs of restored areas from permanent locations to document the temporal development of vegetation. If the restoration monitoring standards presented above are not achieved in Reach 5A within three years of the completion of restoration, appropriate corrective restoration measures will be performed in accordance with a maintenance activity report that will be generated prior to the initiation of any major maintenance activity. If the restoration monitoring standards presented above are achieved in Reach 5A within their required monitoring period, the restoration will be deemed successful and no further maintenance or monitoring will be required or performed.

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10. References

Blasland, Bouck & Lee, Inc. (BBL). 2002. *Conceptual Design Report* – Kress Creek/West Branch DuPage River. DuPage County, IL. 2002.

BBL, 2005a. Final Design/Remedial Action Work Plan – Reach 5A (Areas R5A-1, R5A-3, R5A-4, R5A-4, R5A-8, R5A-10, and R5A-11) for the Kress Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site, May 2005.

BBL, 2005b. Final Design/Remedial Action Work Plan – Reach 5A for the Kress Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site, June 2005.

BBL, 2005c. Conceptual Mitigation and Restoration Design Plan, February 2005.

BBL, 2005d. Common Scoping and Planning Documents for the Remedial Action at the Kress Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site, May 2005.

BBL, 2004. Remedial Investigation Report - Kress Creek/West Branch DuPage River and Sewage Treatment Plant Sites, Dupage County, IL, 2004.

Swink, F. and G. Wilhelm. 1994. *Plants of the Chicago Region*. 4th Edition. Indianapolis: Indiana Academy of Science, 1994.

United States Environmental Protection Agency (USEPA). 2004. Sewage Treatment Plant Site Record of Decision. Issued September 30, 2004.

USEPA. 2005. Kress Creek Record of Decision. Issued March 24, 2005.



Table

Table 8-1
Site-Specific Monitoring Summary - Reach 5A
Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

	Bank Monitoring (1)				Vegetation Monitoring					Performance Standards					
Disturbance Area	Property Type	Yes/No	Duration	In-Stream Structure Monitoring	Number of Herbaceous Upland Plots	Number of Herbaceous Wetland Plots	Number of Planted Trees	Number of Planted Shrubs	Number of Planted Live Stakes	Vegetation Monitoring Duration	% Ground Cover (2)	Invasive Weed Cover	Vegetation Metrics (3)	Tree and Shrub Survival	Live Stake Survival
R5A-1 (53 ft ²)	Gov.	No	1 Year	NA	2	0	0	1	0	1 Year	85%	< 15%	NA	90%	NA
R5A-2 (349 ft ²)	Gov.	Yes	3 Years	NA	2	0	0	0	0	1 Year	85%	< 15%	NA	90%	50%
R5A-3 (57 ft ²)	Gov.	No	1 Year	NA	2	0	0	1	0	1 Year	85%	< 15%	NA	90%	NA
R5A-4 (200 ft ²)	Gov.	No	1 Year	NA	2	0	0	2	0	1 Year	85%	< 15%	NA	90%	NA
R5A-5 (3,878 ft ²)	Gov.	Yes	3 Years	NA	2	0	2	12	28	1 Year	85%	< 15%	NA	90%	50%
R5A-6 (1,621 ft ²)	Gov.	Yes	3 Years	NA	2	0	1	2	16	1 Year	85%	< 15%	NA	90%	50%
R5A-7 (66 ft ²)	River	No	None	NA	0	0	0	0	0	NA	NA	NA	NA	NA	NA
R5A-8 (451 ft ²)	Gov.	Yes	3 Years	NA	2	0	1	7	10	1 Year	85%	< 15%	NA	90%	50%
R5A-9 (1,425 ft ²)	DCFP	Yes	3 Years	NA	0	2	2	15	5	3 Years	90%	< 15%	Yes	90%	NA
R5A-10 (108 ft ²)	DCFP	Yes	3 Years	NA	0	2	0	3	2	3 Years	90%	< 15%	Yes	90%	50%
R5A-11 (5,957 ft ²)	DCFP	Yes	3 Years	NA	0	3	19	4	0	3 Years	90%	< 15%	Yes	90%	NA
R5A-12 (221 ft ²)	DCFP	Yes	3 Years	NA	2	0	0	0	0	1 Year	85%	< 15%	NA	NA	NA
R5A-13 (34 ft ²)	River	No	None	NA	0	0	0	0	0	NA	NA	NA	NA	NA	NA
R5A-14 (43 ft ²)	DCFP	Yes	3 Years	NA	2	0	0	0	0	1 Year	85%	NA	NA	NA	NA
R5A-15 (214 ft ²)	DCFP	Yes	3 Years	NA	2	0	0	0	0	3 Years	90%	NA	NA	NA	NA
Staging Areas (1.4 acres)	Gov.	No	1 Year	NA	10	0	0	0	0	1 Year	85%	< 5%	NA	NA	NA
Access Roads (1,000 ft)	Gov.	No	1 Year	NA	6	0	0	0	0	1 Year	85%	< 5%	NA	90%	NA

Table 8-1 Site-Specific Monitoring Summary - Reach 5A

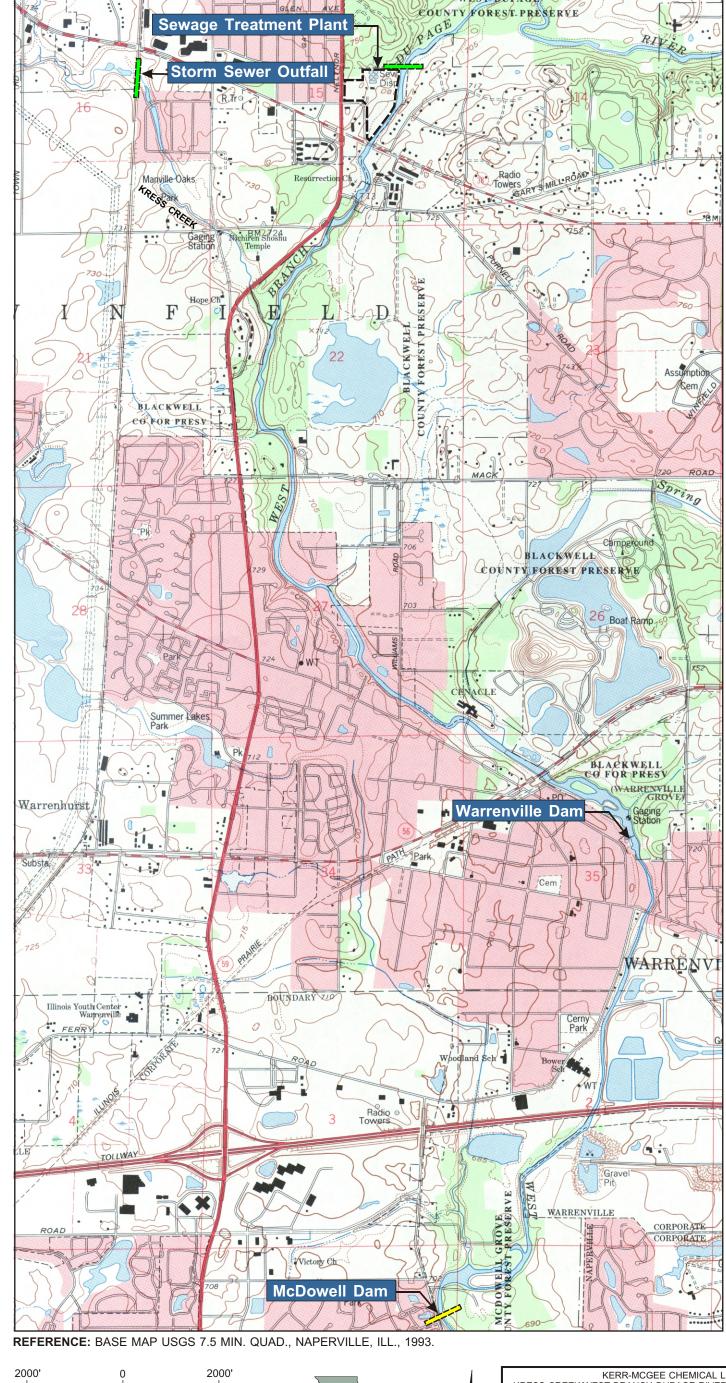
		Bank Mor	nitoring (1)			Vegetation Monitoring						Performance Standards					
Disturbance Area	Property Type	Yes/No	Duration	In-Stream Structure Monitoring	Number of Herbaceous Upland Plots			Number of Planted Shrubs	Number of Planted Live Stakes	Vegetation Monitoring Duration	% Ground Cover (2)	Invasive Weed Cover	Vegetation Metrics (3)	Tree and Shrub Survival	Live Stake Survival		
Access Roads (150 ft)	DCFP	No	3 Years	NA	0	2	0	0	0	3 Years	90%	<15%	Yes	NA	NA		
Access Roads (240 ft)	Church	No	1 Year	NA	2	0	0	0	0	1 Year	85%	< 5%	NA	NA	NA		

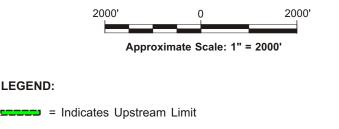
Notes:

- 1. Monitoring start dates are based on inspection and acceptance of the completed work by USEPA and the Local Communities on August 11, 2006.
- 2. Bank monitoring consists of visual evaluation of bank stability and absence of significant erosion.
- 3. An additional performance standard for herbaceous vegetation is the absence of bare areas larger than 0.5 sq meters in size.
- 4. Vegetation metrics performance standard requires increases in Floristic Quality Index (FQI), Mean Coefficient of Conservation (C), and Relative Importance Value (RIV) from the first to the third growing season.



Figure









KERR-MCGEE CHEMICAL LLC KRESS CREEK/WEST BRANCH DUPAGE RIVER SITE AND THE RIVER PORTION OF THE SEWAGE TREATMENT PLANT SITE FINAL COMPLETION REPORT - REACH 5A

SITE LOCATION MAP



LEGEND:

= Indicates Downstream Limit



Appendices



Appendix A

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- 1.2 Reports and Meeting Notes
- 1.3 Legal
 - 1.3-1 Department of Justice
 - 1.3-2 NRD Issues
 - 1.3-3 Karagainus & White
- 1.4 Government
 - 1.4-1 U.S. EPA
 - 1.4-1-1 Correspondence
 - 1.4-1-2 Consent Decree
 - 1.4-1-2-1 Administrative Order for RS/FS
 - 1.4-1-3 Unilateral Administration Order (UAO)
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 - 1.4-2-1 1995 GPS Survey
 - 1.4-2-2 1993 GPS Survey
 - 1.4-3 City of West Chicago
 - 1.4-4 IEMA (formerly IDNS)
 - 1.4-5 Illinois Dept. of Natural Resources
 - 1.4-6 DuPage County Dept. of Environmental Concerns
 - 1.4-7 Illinois Historic Preservation Agency
 - 1.4-8 DuPage County Forest Preserve (Research Permit)
 - 1.4-9 Corp. of Engineers
 - 1.4-10 Illinois Department of Transportation
 - 1.4-11 West Chicago Park District Manville Oaks
 - 1.4-12 The Cenacle
 - 1.4-13 Department of the Army
 - 1.4-14 Permits

1.4-15 Communities/Christopher B. Burke Engineering

- 1.4-15-1 Correspondence
- 1.4-15-2 Environmental Studies
- 1.4-16 City of Warrenville
- 1.4-17 Illinois Environmental Protection Agency (IEPA)
- 1.5 Daily/Weekly Activity Reports
- 1.6 Insurance
- 1.7 Utilities
 - 1.7-1 EJ & E Railroad
- 1.8 Health and Safety
 - 1.8-1 Accident Reports
 - 1.8-2 Safety Meetings
 - 1.8-3 Vehicle Inspections
 - 1.8-4 Site Safety Tour/Inspections
- 1.9 Personnel Records (Including original attendance sheets)
 - 1.9-1 Training Materials
 - 1.9-2 Job Descriptions
- 1.10 Public Relations
 - 1.10-1 Newspaper Articles
- 1.11 Site Administration (Reference: Scope & Planning Docs.)
- 1.12 Quality System
 - 1.12-1 Review Meetings
 - 1.12-2 System Reviews/Audits
 - 1.12-3 NCR's/CAR's (Logs)
- 2.0 Accounting and Finance
 - 2.1 Cost Estimates
 - 2.1-1 Kerr-McGee
 - 2.1-2 Contractors
 - 2.2 AFE's
 - 2.3 Cost Accounting

- **Taxes** 2.5 **Financial Audits**
- 3.0 Engineering

2.4

- 3.1 Work Plan and Specifications (Reference: Scoping and Planning Docs)
 - Risk Assessment and Pre-Design Plan and Biweekly Meeting Notes
 - **Investigation Work Plan Documents**
 - Remedial Design Work Plan Documents
 - Remedial Action Work Plan Documents
- 3.2 Engineering Drawings (See 7.1 for Individual Property Plans)
 - 3.2 1**Engineering Calculations**
 - 3.2.2 **Cross Sections**
 - 3.2.3 **Verification Drawings**
 - 3.2 3 1Base of Excavation
 - 3.2-3-2 Overburden Removal
 - 3.2.4 Reports
 - 3.2-5 Characterization
- Contracts Engineering 3.3
 - 3.3-1 West Central Environmental Consultants/ProSource (Correspondence)
 - 3.3-1-1 Bidder Qualification
 - 3.3-1-2 Bid Package (Including Response & Analysis)
 - 3.3-1-3 Contract & Amendments
 - 3.3-1-3-1 Work Change Request
 - 3.3-1-3-2 **Progress Invoices**
 - 3.3-1-4 Estimates & Forecasts
 - 3.3-1-5 Schedules
 - 3.3-1-6 Reports
 - 3.3-1-7 Characterization Report
 - 3.3-2Weston, Inc. (Correspondence)
 - 3.3-2-1 Bidder Qualifications
 - 3.3-2-2 Bid Package (Including Response & Analysis)

(Retention Period is lifetime per Kerr-McGee Legal Department)

	3.3-2-3	Contract &	Amendments
		3.3-2-3-1	Work Change Request
		3.3-2-3-2	Progress Invoices
	3.3-2-4	Estimates &	& Forecasts
	3.3-2-5	Schedules	
	3.3-2-6	Reports	
3.3-3	R. H. Aı	nderson (Cor	respondence)
	3.3-3-1	Bidder Qua	lifications
	3.3-3-2	Bid Packag	e (Including Response & Analysis)
	3.3-3-3	Contract &	Amendments
		3.3-3-3-1	Work Change Request
		3.3-3-3-2	Progress Invoices
	3.3-3-4	Estimates &	k Forecasts
	3.3-3-5	Schedules	
	3.3-3-6	Reports	
3.3-4	Indepen	dent Testing	Support - (Correspondence)
	3.3-4-17	ΓSC	
	3.3.4-2 I	Hazen	
	3.3-4-31	Lancaster	
3.3-5	T.L. Ric	e Inc. (Corre	espondence)
	3.3-5-11	Bidder Quali	fication (Resume')
	3.3-5-30	Contracts and	l Amendments
	3.3-5-6I	Reports	
3.3-6	BBL Inc	c. (Correspon	ndence)
	3.3-6-1	Bidder Qua	lifications
	3.3-6-2	Bid Packag	e (Including Response and Analysis)
	3.3-6-3	Contract an	d Amendments
		3.3-6-3-1	Change Orders (Work Changes)
		3.3-6-3-2	Invoices
	3.3-6-4	Reach Spec	cific Alternatives Evaluation Report (RSAE)

(Retention Period is lifetime per Kerr-McGee Legal Department)

			3.3-6-4-1	Comments to RSAE Report
		3.3-6-5	Conceptual	Design Report
			3.3-6-5-1	Comments to Conceptual Design Report
			3.3-6-5-2	Reach 8 Addendum
		3.3-6-6	Conceptual	Restoration Plan
			3.3-6-6-1	Comments to Conceptual Restoration Plan
		3.3-6-7	Reports	
			3.3-6-7-1	Transportation Plan
			3.3-6-7-2	ARARS
		3.3-6-8	Detailed De	esign
			3.3-6-8-1	Engineering Calculations
			3.3-6-8-2	Drawings
			3.3-6-8-3	FEQ Modeling
			3.3-6-8-4	Operation and Maintenance
		3.3-6-9	RI/FS	
			3.3-6-9-1	Remedial Investigation/Comments
			3.3-6-9-2	Feasibility Study
3.4	Previo	ous Investi	igations (Pre-	-1997)
3.5	Field I	nvestigat	ion (1997 to	current)
	3.5-1	Surface	Gamma Surv	rey
		3.5-1-1H	Field Data	
		3.5-1-2N	Maps	
	3.5-2	Shallow	Soil Test Ho	oles
		3.5-2-1	1997 Boreh	ole Field Logs
		3.5-2-2	1998 Boreh	ole Field Logs
		3.5-2-3	1999 Boreh	ole Field Logs
		3.5-2-4	2000 Boreh	ole Field Logs
		3.5-2-5	2001 Boreh	ole Field Logs
		3.5-2-6	2002 Boreh	ole Field Logs
		3.5-2-7	Soil Boring	Log Sheets

(Retention Period is lifetime per Kerr-McGee Legal Department)

	3.5-2-8 Radiological Lab Data
	3.5-2-9 Land Surveying
	3.5-2-10 Field Maps
	3.5-2-11 Borehole Logging Master Spreadsheets & Checkprints
	3.5-2-12 Underwater Soil Sample (Hazen)
	3.5-2-13 Daily Summary
3.5-3	Deep Soil Borings
	3.5-3-1 Soil Boring Logs
	3.5-3-2 Downhole Gamma Logging
	3.5-3-3 Geotechnical Soil Testing
	3.5-3-4 Radiological Lab Data
	3.5-3-5 Land Surveying
	3.5-3-6 Field Maps
3.5-4	Piezometers/Staff Gauges/Stream Flow/Surface Water
	3.5-4-1 Soil Boring Logs
	3.5-4-2 Borehole Field Logs
	3.5-4-3 Radiological Lab Data
	3.5-4-4 Land Surveying
	3.5-4-5 Water Level Field Data
	3.5-4-6 Stream Flow Calculations
	3.5-4-7 Field Maps
	3.5-4-8 Chain of Custody
	3.5-4-9 Water Analysis (Manville OAKS Park Pond)
	3.5-4-10 Sediment Sampling
3.5-5	Field Log Books
3.5-6	Aerial Photos
3.5-7	Weston Tree Study
3.5-8	Weston Wetlands Maps for West Branch DuPage River
Data C	Output ARCHIVE - Including all extensions thru 3.6-3

3.6

	4.1	BBL ((Corresponde	ence)
		4.1-1	Bidder Qua	alification (See 3.3-6-1)
		4.1-2	Bid Packag	ge (See 3.3-6-2)
		4.1-3	Contracts &	& Amendments
			4.1-3-1	Change Orders (Work Changes)
			4.1-3-2	Invoices
			4.1-3-3	Submittals
		4.1-4	Schedules	
		4.1-5	Reports	
			4.1-5-1	Manpower Estimate & Forecast
			4.1-5-2	QC Field Reports
			4.1-5-3	Safety/Incident Reports
			4.1-5-4	Turnover Documents
		4.1-6	Verification	n Data
			4.1-6-1	Verf., Maps, and Data (Bottom of OB and BP)
			4.1-6-2	Field Logbooks
			4.1-6-3	Calibration Records (Raw Data GPS)
		4.1-7	Maintenand	ce Inspection Reports
	4.2	Misce	llaneous Cor	ntracts (RD-n-P Drilling)
5.0	Procu	irement	- Purchase O	orders (Filed numerically with approval documents, bid evaluation, receiving reports, specs, etc
	5.1	Contra	actor Procure	ement and Meetings
		5.1-1	Property or	Equipment Loss - Inventory
	5.2	Kerr-I	McGee Procu	rement
	5.3	Vendo	or List	
6.0	Healt	h Physic	es	
	6.1	Air M	onitoring	
	6.2	Surve	y Data	
		6.2-1	Backfill Sa	mple Analysis – Report (Sources)
	6.3	Instru	ment/Equipn	nent Calibrations and Quality Assurance (H.P. 17.0000)
	6.4	Respi	ratory Protec	tion Program Maintenance

(Retention Period is lifetime per Kerr-McGee Legal Department)

6.5	Dosimetry	Monitoring .	Data

- 6.6 Safe Work Permits
- 6.7 Downhole and Gamma Logging
 - 6.7-1 Bridges Westwind Division
- 6.8 Water Survey
- 6.9 Training
- 7.0 Property Completions
 - 7.1 Work Orders
 - 7.1-1 Parcel Folders (access agreements, photographs, etc.)
 - 7.2 Access Agreements
 - 7.3 Bills of Lading
 - 7.4 Materials Handled (Overburden Verification)
 - 7.5 Invoices
 - 7.6 Radiological Sampling and Data Verifications (Soil Samples)
 - 7.6-1 Excavation Depth Verifications
 - 7.7 Notifications / Verification Release from U.S. EPA
 - 7.8 Acceptance from City of West Chicago
 - 7.9 Property Video Survey
- 8.0 Closure Report

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Appendix B

Summary Table for the GPS Verification Packages Issued for the Bottom of Overburden Material

Appendix B

Summary Table for the GPS Verification Packages Issued for the Bottom of Overburden Material

Final Completion Report – Reach 5A for the Kress Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site

Tronox LLC – DuPage County, Illinois

Reach Area	Tronox File No.	Document No.	Package Delivery Date and Methods
R5A-1	N/A	N/A	No overburden was present in this area
R5A-2	KC 4.1-6-1	KC 024; KC 025	07/13/05 and 07/15/05 (Rev 1) via email
R5A-3	KC 4.1-6	KC 005	11/03/04 via email
R5A-4	KC 4.1-6	KC 005	11/03/04 via email
R5A-5	KC 4.1-6-1	KC 024; KC 025	07/13/05 and 07/15/05 (Rev 1) via email
R5A-6	KC 4.1-6-1	KC 027A; KC 027A	07/22/07 and 04/12/06 (Revised Figure 1)
		(Revision 1)	via email
R5A-7	KC 4.1-6-1	KC 026	07/20/05 via email
R5A-8	KC 4.1-6	KC 008	11/09/04 via email
R5A-9	KC 4.1-6-1	KC 029	07/25/05 via email
R5A-10	N/A	N/A	No overburden was present in this area
R5A-11	KC 4.1-6	KC 012	11/11/04 via email
R5A-12	KC 4.1-6-1	KC 036	08/02/05 via email
R5A-13	KC 4.1-6-1	KC 030	07/25/05 via email
R5A-14	KC 4.1-6-1	KC 031	07/25/05 via email
R5A-15	KC 4.1-6-1	KC 032	07/25/05 via email

Notes:

N/A - Not Applicable

Distribution Initiator:

Michael Savage, ARCADIS BBLES

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Jerry Krane, ProSource

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Appendix C

Summary Table for the GPS Verification Packages Issued for the Bottom of Targeted Material

Appendix C Summary Table for the GPS Verification Packages Issued for the Bottom of Targeted Material

Final Completion Report – Reach 5A for the Kress Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC – DuPage County, Illinois

Reach Area	Tronox File No.	Document No.	Package Delivery Date and Methods
R5A-1	KC 4.1-6	KC 006	11/09/04 via email
R5A-2	KC 4.1-6-1	KC 027	07/20/05 via email
R5A-3	KC 4.1-6	KC 007	11/08/04 via email
R5A-4	KC 4.1-6	KC 007	11/08/04 via email
R5A-5S;	KC 4.1-6-1	KC 042; KC 033	08/05/05 via email; 07/27/05 via email
R5A-5N			
R5A-6S;	KC 4.1-6-1	KC 034; KC 043	07/25/07 via email ; 08/05/05 via email
R5A-6N			
R5A-7	KC 4.1-6-1	KC 028A	07/25/05 via email
R5A-8	KC 4.1-6	KC 011	11/11/04 via email
R5A-9	KC 4.1-6-1	KC 039	08/03/05 via email
R5A-10	KC 4.1-6	KC 010	11/10/04 via email
R5A-11	KC 4.1-6	KC 016	11/18/04 via email
R5A-12	KC 4.1-6-1	KC 038	08/02/05 via email
R5A-13	KC 4.1-6-1	KC 040	08/05/05 via email
R5A-14	KC 4.1-6-1	KC 041	08/05/05 via email
R5A-15	KC 4.1-6-1	KC 035	08/05/05 via email

Notes:

Distribution Initiator:

Michael Savage, ARCADIS BBLES

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Mike Mahar, Sevenson
Mark Schmitt, Sevenson
Jerry Krane, ProSource



Appendix D

Comprehensive GPS Verification Survey for the Bottom of Overburden – Reach 5A

Attachment D

Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-1

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design			Actual			Data Comparison			Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-1-11849t	1023199.800	1893497.200	GS	1023199.733	1893497.189	703.438	-0.067	-0.011	NA	
5	R5a-1-T1	1023205.700	1893504.200	GS	1023205.636	1893504.246	702.664	-0.064	0.046	NA	
5	R5a-1-T2	1023199.100	1893501.900	GS	1023199.130	1893501.902	703.804	0.030	0.002	NA	
5	R5a-1-T3	1023195.700	1893497.700	GS	1023195.808	1893497.625	705.187	0.108	-0.075	NA	
5	R5a-1-T4	1023204.000	1893496.200	GS	1023203.924	1893496.228	702.312	-0.076	0.028	NA	
5	R5a-1-T5	1023200.300	1893494.800	GS	1023200.226	1893494.685	703.216	-0.074	-0.115	NA	

 $\frac{\text{Notes:}}{\Delta \text{ Elevation}} > 0.16 \text{ ft Blue}$ Δ Easting/Northing < or = 0.2 ft Green

 Δ Elevation 0.16 to -0.16 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment D
Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-2

		Design				Actual		D	ata Compari	son	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-2-11814t	1023216.700	1893446.300	GS	1023216.742	1893446.287	699.968	0.042	-0.013	NA	
5	R5a-2-11815t	1023207.500	1893446.400	GS	1023207.448	1893446.372	701.000	-0.052	-0.028	NA	
5	R5a-2-11816t	1023204.500	1893446.500	GS	1023204.474	1893446.529	701.681	-0.026	0.029	NA	
5	R5a-2-11819t	1023206.500	1893438.100	GS	1023206.522	1893438.153	701.033	0.022	0.053	NA	
5	R5a-2-11858t	1023220.400	1893456.000	GS	1023220.451	1893455.914	699.909	0.051	-0.086	NA	
5	R5a-2-15030t	1023195.900	1893446.200		1023195.928	1893446.212	704.563	0.028	0.012	1.163	Tronox directed to take all material as targeted
5	R5a-2-T1	1023215.200	1893460.300		1023215.209	1893460.322	700.340	0.009	0.022	NA	
5	R5a-2-T10	1023191.100	1893443.200	703.4	1023191.108	1893443.227	706.364	0.008	0.027	2.964	Tronox directed to take all material as targeted
5	R5a-2-T11	1023196.400	1893442.600	703.4	1023196.356	1893442.630	704.933	-0.044	0.030	1.533	Tronox directed to take all material as targeted
5	R5a-2-T12	1023204.300	1893442.200	GS	1023204.303	1893442.227	701.544	0.003	0.027	NA	
5	R5a-2-T13	1023210.700	1893442.100		1023210.679	1893442.019	700.600	-0.021	-0.081	NA	
5	R5a-2-T14	1023215.300	1893442.000	GS	1023215.316	1893442.040	700.079	0.016	0.040	NA	
5	R5a-2-T15	1023210.200	1893437.900		1023210.204	1893437.927	700.722	0.004	0.027	NA	
5	R5a-2-T16	1023205.900	1893434.600		1023205.933	1893434.636	701.152	0.033	0.036	NA	
5	R5a-2-T2	1023222.700	1893459.300	GS	1023222.682	1893459.369	699.851	-0.018	0.069	NA	
5	R5a-2-T3	1023217.500	1893455.900	GS	1023217.559	1893455.890	700.198	0.059	-0.010	NA	
5	R5a-2-T4	1023224.000	1893455.500	GS	1023223.972	1893455.562	699.761	-0.028	0.062	NA	
5	R5a-2-T5	1023195.800	1893452.400		1023195.737	1893452.415	705.069	-0.063	0.015	1.669	Tronox directed to take all material as targeted
5	R5a-2-T6	1023204.700	1893451.800		1023204.718	1893451.813	701.473	0.018	0.013	NA	
5	R5a-2-T7	1023215.600	1893451.100	GS	1023215.501	1893451.159	700.075	-0.099	0.059	NA	
5	R5a-2-T8	1023191.300	1893446.200	703.4	1023191.270	1893446.208	705.840	-0.030	0.008	2.440	Tronox directed to take all material as targeted
5	R5a-2-T9	1023220.000	1893445.500	GS	1023219.964	1893445.509	699.980	-0.036	0.009	NA	

Notes:

Attachment D

Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-3

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

	Design					Actual			ata Compar		Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	△ Northing	∆ Elevation	
5	R5a-3-12371t	1023188.300	1893432.600	705.6	1023188.384	1893432.625	705.698	0.084	0.025	0.098	
5	R5a-3-T1	1023183.200	1893435.900	705.6	1023183.102	1893435.849	705.737	-0.098	-0.051	0.137	
5	R5a-3-T2	1023192.600	1893435.800	705.6	1023192.680	1893435.796	705.587	0.080	-0.004	-0.013	
5	R5a-3-T3	1023193.200	1893430.900	705.6	1023193.164	1893430.847	705.675	-0.036	-0.053	0.075	
5	R5a-3-T4	1023184.200	1893428.600	705.6	1023184.255	1893428.557	705.559	0.055	-0.043	-0.041	

Notes:

 Δ Elevation > 0.16 ft Blue Δ Easting/Northing < or = 0.2 ft Green

 Δ Elevation 0.16 to -0.16 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment D Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-4

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design				Actual			ata Compar		Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-4-12352t	1023197.500	1893393.800	703.5	1023197.515	1893393.757	703.441	0.015	-0.043	-0.059	
5	R5a-4-12375t	1023200.200	1893409.100	703.8	1023200.185	1893409.087	703.741	-0.015	-0.013	-0.059	
5	R5a-4-15131t	1023200.100	1893402.900	704.5	1023200.133	1893402.918	704.465	0.033	0.018	-0.035	
5	R5a-4-T1	1023198.700	1893413.200	703.8	1023198.650	1893413.176	703.906	-0.050	-0.024	0.106	
5	R5a-4-T2	1023202.900	1893410.100	703.8	1023202.893	1893410.100	703.792	-0.007	0.000	-0.008	
5	R5a-4-T3	1023193.700	1893409.500	703.8	1023193.745	1893409.458	703.862	0.045	-0.042	0.062	
5	R5a-4-T4	1023193.800	1893401.900	704.5	1023193.861	1893401.862	704.616	0.061	-0.038	0.116	
5	R5a-4-T5	1023203.300	1893400.300	704.5	1023203.278	1893400.304	704.616	-0.022	0.004	0.116	
5	R5a-4-T6	1023192.200	1893394.200	703.5	1023192.208	1893394.284	703.566	0.008	0.084	0.066	
5	R5a-4-T7	1023195.000	1893389.100	703.5	1023195.006	1893389.145	703.605	0.006	0.045	0.105	
5	R5a-4-T8	1023200.000	1893389.000	703.5	1023199.973	1893388.989	703.549	-0.027	-0.011	0.049	

Notes:

 $\overline{\Delta}$ Elevation > 0.16 ft Blue Δ Easting/Northing < or = 0.2 ft Green Δ Elevation 0.16 to -0.16 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment D
Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-5

		Design				Actual		Da	ata Compari	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-5-11778t	1023202.800	1893350.600	702.0	1023202.823	1893350.593	702.108	0.023	-0.007	0.108	
5	R5a-5-11787t	1023205.200	1893367.000	701.0	1023205.203	1893367.012	701.364	0.003	0.012	0.364	
5	R5a-5-11788t	1023203.300	1893367.300	701.3	1023203.377	1893367.346	701.698	0.077	0.046	0.398	
5	R5a-5-11797t	1023205.300	1893383.500	GS	1023205.335	1893383.457	701.157	0.035	-0.043	NA	
5	R5a-5-11799t	1023201.600	1893376.500	702.8	1023201.644	1893376.444	702.959	0.044	-0.056	0.159	
5	R5a-5-11887t	1023200.400	1893336.700	703.0	1023200.344	1893336.691	702.840	-0.056	-0.009	-0.160	
5	R5a-5-11889t	1023202.800	1893318.500	701.6	1023202.829	1893318.478	701.881	0.029	-0.022	0.281	
5	R5a-5-11891t	1023201.900	1893309.200	700.6	1023201.855	1893309.216	701.387	-0.045	0.016	0.787	
5	R5a-5-11894t	1023198.200	1893303.300		1023198.305		701.806	0.105	-0.025	1.206	
5	R5a-5-11896t	1023198.200	1893293.800	701.6	1023198.244	1893293.852	701.385	0.044	0.052	-0.215	
5	R5a-5-11898t	1023196.800	1893286.400	701.1	1023196.736	1893286.434	701.410	-0.064	0.034	0.310	
5	R5a-5-11904t	1023193.200	1893279.300	702.6	1023193.167	1893279.289	702.376	-0.033	-0.011	-0.224	
	R5a-5-11905t			700.5	1023183.152		701.711	-0.048	0.030	1.211	
5	R5a-5-11906t	1023180.000	1893243.300	701.4	1023180.049	1893243.252	701.697	0.049	-0.048	0.297	
5	R5a-5-11909t	1023176.400	1893224.300	701.5	1023176.363	1893224.295	701.695	-0.037	-0.005	0.195	
5	R5a-5-11912t	1023178.200	1893206.800	700.4	1023178.206	1893206.735	701.459	0.006	-0.065	1.059	
	R5a-5-11914t				1023175.498			-0.002	-0.012	NA	
	R5a-5-11917t			701.1		1893178.673	701.285	0.009	0.073	0.185	
	R5a-5-11932t				1023188.566			-0.034	-0.001	-0.134	
					1023185.825		701.891	-0.075	0.057	0.291	
		1023192.900			1023192.934			0.034	-0.014	0.110	
	R5a-5-12339t		1893303.200		1023188.334			0.034	-0.082	0.285	
					1023181.854			-0.046	-0.088	0.395	
		1023178.700			1023178.624			-0.076	-0.030	0.418	
		1023184.800			1023184.837		702.483	0.037	-0.023	0.383	
	R5a-5-12344t				1023175.798		702.885	-0.002	0.084	0.285	
	R5a-5-12345t			701.7			701.945	0.033	0.025	0.245	
		1023193.900			1023193.953			0.053	0.046	0.067	
	R5a-5-12357t				1023195.740		704.628	-0.060	0.042	-0.172	
	R5a-5-12360t				1023191.730		703.622	0.030	-0.007	0.122	
	R5a-5-14939t				1023161.532		703.059	0.032	0.069	0.359	
		1023155.900			1023155.849			-0.051	0.013	0.300	
		1023154.200			1023154.278			0.078	0.043	0.235	
	R5a-5-14967t			705.1	1023139.030		705.153	0.030	0.052	0.053	
					1023138.617			0.017	0.016	0.423	
		1023167.600			1023167.634			0.034	0.019	0.269	
5	R5a-5-15025t	1023172.600	1893242.100	701.6	1023172.544	1893242.049	701.617	-0.056	-0.051	0.017	

Notes:

 $\begin{array}{ll} \Delta \; \text{Elevation} > 0.5 \; \text{ft Blue} & \Delta \; \text{Easting/Northing} < \text{or} = 0.2 \; \text{ft Green} \\ \Delta \; \text{Elevation} \; 0.5 \; \text{to} \; -0.25 \; \text{ft Green} & \Delta \; \text{Easting/Northing} > 0.2 \; \text{ft Blue} \\ \end{array}$

Attachment D
Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-5

		Design				Actual		Da	ata Compari	son	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	△ Northing	∆ Elevation	
5	R5a-5-15132t	1023195.800	1893374.800	705.3	1023195.800	1893374.701	705.464	0.000	-0.099	0.164	
5	R5a-5-15135t	1023172.300	1893193.200	703.6	1023172.200	1893193.158	703.898	-0.100	-0.042	0.298	
5	R5a-5-T1	1023205.600	1893387.100	GS	1023205.631	1893387.177	701.806	0.031	0.077	NA	
5	R5a-5-T10	1023209.600	1893366.700	701.0	1023206.000	1893366.682	700.959	-3.600	-0.018	-0.041	Pt. moved towards 11787 to achieve design elev.
5	R5a-5-T11	1023208.600	1893362.400	701.0	1023205.637	1893363.012	701.007	-2.963	0.612	0.007	Pt. moved towards 12357 to achieve design elev.
5	R5a-5-T12	1023191.700	1893358.100	704.8	1023191.659	1893358.066	705.116	-0.041	-0.034	0.316	-
5	R5a-5-T13	1023199.300	1893350.400	GS	1023199.307	1893350.411	703.428	0.007	0.011	NA	
5	R5a-5-T14	1023204.200	1893350.300	GS	1023204.171	1893350.316	701.354	-0.029	0.016	NA	
5	R5a-5-T15	1023196.900	1893340.200	GS	1023196.863	1893340.234	704.474	-0.037	0.034	NA	
5	R5a-5-T16	1023202.200	1893336.500	GS	1023202.178	1893336.450	701.305	-0.022	-0.050	NA	
5	R5a-5-T17		1893334.800	703.5	1023188.364	1893334.742	703.782	0.064	-0.058	0.282	
5	R5a-5-T18	1023203.400	1893327.400	701.6	1023203.401	1893327.323	701.720	0.001	-0.077	0.120	
5	R5a-5-T19	1023188.900	1893326.300	703.7	1023188.886	1893326.255	703.852	-0.014	-0.045	0.152	
5	R5a-5-T2	1023209.000	1893382.600	GS	1023209.011	1893382.561	700.385	0.011	-0.039	NA	
5	R5a-5-T20	1023189.500	1893319.700	703.7	1023189.457	1893319.701	704.004	-0.043	0.001	0.304	
5	R5a-5-T21	1023203.600	1893318.300	701.6	1023203.166	1893318.368	701.637	-0.434	0.068	0.037	Pt. moved towards 11889 to achieve design elev.
5	R5a-5-T22	1023195.600	1893309.300	700.6	1023195.522	1893309.374	701.453	-0.078	0.074	0.853	
5	R5a-5-T23	1023205.400	1893308.500	700.6	1023205.382	1893308.514	700.485	-0.018	0.014	-0.115	
5	R5a-5-T24	1023193.700	1893306.400	700.6	1023193.669	1893306.325	701.425	-0.031	-0.075	0.825	
5	R5a-5-T25	1023185.300	1893305.700	703.4	1023185.278	1893305.667	703.581	-0.022	-0.033	0.181	
5	R5a-5-T26	1023203.400	1893302.700	700.6	1023203.340	1893302.613	700.539	-0.060	-0.087	-0.061	
5	R5a-5-T27	1023184.800	1893299.500	703.4	1023184.792	1893299.481	703.413	-0.008	-0.019	0.013	
5	R5a-5-T28	1023181.600	1893292.000	702.3	1023181.567	1893291.932	702.595	-0.033	-0.068	0.295	
5	R5a-5-T29	1023198.500	1893290.400	GS	1023198.448	1893290.364	701.095	-0.052	-0.036	NA	
5	R5a-5-T3	1023202.100	1893380.300	702.8	1023202.043	1893380.311	702.849	-0.057	0.011	0.049	
5	R5a-5-T30	1023177.200	1893288.300	702.3	1023177.212	1893288.217	702.763	0.012	-0.083	0.463	
5	R5a-5-T31	1023196.500	1893283.000	701.1	1023196.434	1893282.949	701.292	-0.066	-0.051	0.192	
5	R5a-5-T32		1893279.400	703.0	1023175.032	1893279.359	703.404	0.032	-0.041	0.404	
5	R5a-5-T33	1023193.600	1893275.400	702.6	1023193.574	1893275.331	702.456	-0.026	-0.069	-0.144	
5	R5a-5-T34	1023172.200	1893272.100	702.6	1023172.186	1893272.025	702.801	-0.014	-0.075	0.201	
5	R5a-5-T35	1023189.400	1893271.700		1023189.454			0.054	-0.016	0.341	
5	R5a-5-T36	1023191.300	1893267.600	GS	1023191.238	1893267.670	703.949	-0.062	0.070	NA	
5	R5a-5-T37	1023190.900	1893262.400	GS	1023190.863	1893262.458	701.390	-0.037	0.058	NA	
5	R5a-5-T38	1023173.700	1893258.200	701.7		1893258.183		-0.069	-0.017	0.311	
5	R5a-5-T39	1023187.700	1893255.700	701.6	1023187.694	1893255.657	701.577	-0.006	-0.043	-0.023	
	R5a-5-T4	1023194.500	1893379.400	GS	1023194.426	1893379.422		-0.074	0.022	NA	
5	R5a-5-T40	1023171.400	1893250.300	701.6	1023171.366	1893250.326	701.552	-0.034	0.026	-0.048	

Notes

 $\begin{array}{ll} \overline{\Delta \; \text{Elevation}} > 0.5 \; \text{ft Blue} & \Delta \; \text{Easting/Northing} < \text{or} = 0.2 \; \text{ft Green} \\ \Delta \; \text{Elevation} \; 0.5 \; \text{to} \; -0.25 \; \text{ft Green} & \Delta \; \text{Easting/Northing} > 0.2 \; \text{ft Blue} \\ \end{array}$

Attachment D
Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-5

		Design				Actual			ata Compari		Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-5-T41	1023186.300	1893248.200	700.5	1023186.297	1893248.161	701.530	-0.003	-0.039	1.030	
5	R5a-5-T42	1023168.200	1893242.500	701.6	1023168.218	1893242.580	701.581	0.018	0.080	-0.019	
5	R5a-5-T43	1023188.200	1893240.800	700.5	1023188.179	1893240.871	700.784	-0.021	0.071	0.284	
5	R5a-5-T44	1023182.500	1893237.400	700.5	1023182.483	1893237.390	701.458	-0.017	-0.010	0.958	
5	R5a-5-T45	1023165.700	1893233.000	700.4	1023165.677	1893232.981	700.481	-0.023	-0.019	0.081	
5	R5a-5-T46	1023177.200	1893224.100	701.5	1023177.181	1893224.125	701.508	-0.019	0.025	0.008	
5	R5a-5-T47	1023163.600	1893223.500	700.4	1023163.559	1893223.503	700.222	-0.041	0.003	-0.178	
5	R5a-5-T48	1023178.700	1893219.800	701.5	1023177.484	1893219.796	701.456	-1.216	-0.004	-0.044	Pt. moved towards 14999 to achieve design elev.
5	R5a-5-T49	1023179.600	1893211.000	700.4	1023179.661	1893210.931	700.915	0.061	-0.069	0.515	
5	R5a-5-T5	1023203.800	1893376.000	702.8	1023201.941	1893376.060	702.726	-1.859	0.060	-0.074	Pt. moved towards 11799 to achieve design elev.
5	R5a-5-T50	1023160.800	1893210.900	702.7	1023160.835	1893210.889	702.831	0.035	-0.011	0.131	
5	R5a-5-T51	1023157.400	1893207.900	702.7	1023157.423	1893207.921	702.923	0.023	0.021	0.223	
5	R5a-5-T52	1023182.400	1893206.200	700.4	1023182.311	1893206.162		-0.089	-0.038	-0.235	
5	R5a-5-T53	1023137.300			1023137.287	1893202.045		-0.013	-0.055	0.391	
5	R5a-5-T54	1023154.600				1893201.298		0.021	-0.002	0.271	
5	R5a-5-T55	1023149.500	1893199.100	702.2	1023149.521	1893199.112		0.021	0.012	0.027	
	R5a-5-T56	1023135.300			1023135.273	1893197.984		-0.027	-0.016	0.327	
	R5a-5-T57	1023179.400							0.019	NA	
5	R5a-5-T58	1023134.800	1893186.500	703.0	1023134.835			0.035	0.113	0.203	
5	R5a-5-T59	1023142.600						-0.043	-0.050	0.033	
5	R5a-5-T6	1023193.000							0.062	NA	
5	R5a-5-T60	1023150.400						0.027	0.059	0.351	
5	R5a-5-T61	1023177.000						0.036	0.046	NA	
	R5a-5-T62	1023172.000							-0.412		Excavated to new riprap of 48" pipe effluent
	R5a-5-T63	1023151.400							0.032	0.389	
5	R5a-5-T7	1023204.600						-0.007	0.088	0.131	
5	R5a-5-T8	1023208.200			1023205.650			-2.550	-0.128		Pt. moved towards 12356 to achieve design elev.
5	R5a-5-T9	1023190.400	1893367.600	704.5	1023190.342	1893367.679	704.727	-0.058	0.079	0.227	

Notes:

 Δ Elevation > 0.5 ft Blue Δ Easting/Northing < or = 0.2 ft Green

 Δ Elevation 0.5 to -0.25 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment D
Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-6

		Design				Actual		Da	ata Compar	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-6-11938t	1023167.500	1893157.600	GS	1023167.496	1893157.605	703.294	-0.004	0.005	NA	
	R5a-6-11940t				1023167.008		702.765	0.008	0.031	0.465	
5	R5a-6-11958t	1023158.400	1893132.400	703.5	1023158.414	1893132.365	703.839	0.014	-0.035	0.339	
5	R5a-6-11961t	1023162.100	1893115.800	700.5	1023162.064	1893115.860	700.889	-0.036	0.060	0.389	
5	R5a-6-11962t	1023159.600	1893115.400	701.7	1023159.581	1893115.321	701.644	-0.019	-0.079	-0.056	
5	R5a-6-11964t	1023161.400	1893100.400	GS	1023161.437	1893100.494	700.540	0.037	0.094	NA	
5	R5a-6-11965t	1023152.600	1893101.500	GS	1023152.646	1893101.405	700.838	0.046	-0.095	NA	
5	R5a-6-11966t	1023150.600	1893102.100	701.1	1023150.553	1893102.138	701.266	-0.047	0.038	0.166	
5	R5a-6-11967t	1023160.000	1893090.900	GS	1023159.944	1893090.870	700.307	-0.056	-0.030	NA	
	R5a-6-11968t			700.7	1023151.052	1893095.456	701.688	0.052	-0.044	0.988	Tronox directed to take all material as targeted
5	R5a-6-11973t	1023168.000	1893089.800	GS	1023167.955	1893089.694	700.301	-0.045	-0.106	NA	
5	R5a-6-14953t	1023141.500	1893131.300	703.1	1023141.461	1893131.230	703.487	-0.039	-0.070	0.387	
5	R5a-6-14954t	1023142.200	1893114.600	704.0	1023142.184	1893114.624	703.872	-0.016	0.024	-0.128	
5	R5a-6-14977t	1023146.800	1893141.200	704.2	1023146.765	1893141.183	704.571	-0.035	-0.017	0.371	
5	R5a-6-14983t	1023137.100	1893108.600	704.2	1023137.141	1893108.576	704.394	0.041	-0.024	0.194	
5	R5a-6-15991t	1023149.800	1893157.500	701.5	1023149.800	1893157.500	709.000	0.000	0.000	7.500	All taken as TM; see Area 4 of STP
5	R5a-6-15992t	1023151.000	1893148.500	700.3	1023151.064	1893148.513	700.792	0.064	0.013	0.492	
5	R5a-6-T1	1023152.400	1893162.900	701.5	1023152.400	1893162.900	708.000	0.000	0.000	6.500	All taken as TM; see Area 1 pt. T204 of STP
5	R5a-6-T10	1023166.100	1893115.600	700.5	1023166.119	1893115.631	700.404	0.019	0.031	-0.096	·
5	R5a-6-T11	1023161.000	1893111.400	701.7	1023160.001	1893113.963	701.557	-0.999	2.563	-0.143	Pt. moved towards 11962 to achieve design elev.
5	R5a-6-T12	1023133.400	1893109.700	704.2	1023133.404	1893109.696	704.406	0.004	-0.004	0.206	
5	R5a-6-T13	1023135.400	1893105.000	704.2	1023135.375	1893104.978	704.534	-0.025	-0.022	0.334	
5	R5a-6-T14	1023157.500	1893104.500	GS	1023157.547	1893104.628	701.008	0.047	0.128	NA	
5	R5a-6-T15	1023161.900	1893103.900	GS	1023161.798	1893103.967	700.519	-0.102	0.067	NA	
5	R5a-6-T16	1023142.300	1893103.300	704.2	1023142.275	1893103.321	704.234	-0.025	0.021	0.034	
5	R5a-6-T17	1023150.300	1893095.500	700.7	1023150.171	1893095.503	701.623	-0.129	0.003	0.923	Tronox directed to take all material as targeted
5	R5a-6-T18	1023169.000	1893094.700	GS	1023169.002	1893094.722	700.371	0.002	0.022	NA	-
5	R5a-6-T19	1023173.400	1893093.900	GS	1023173.441	1893093.919	700.195	0.041	0.019	NA	
5	R5a-6-T2	1023170.900	1893160.600	GS	1023170.900	1893160.600	702.000	0.000	0.000	NA	All taken as TM; see Area 1 pt. T208 of STP
5	R5a-6-T20	1023149.900	1893091.800	700.7	1023149.826	1893091.745	700.970	-0.074	-0.055	0.270	
5	R5a-6-T21	1023172.300	1893088.800	GS	1023172.270	1893088.714	700.523	-0.030	-0.086	NA	
5	R5a-6-T22	1023158.900	1893087.700	GS	1023158.880	1893087.630	700.295	-0.020	-0.070	NA	
5	R5a-6-T23	1023167.200	1893086.500	GS	1023167.173	1893086.531	699.920	-0.027	0.031	NA	
5	R5a-6-T3	1023171.500	1893156.300	GS	1023171.530	1893156.256	701.948	0.030	-0.044	NA	
5	R5a-6-T4	1023168.300	1893148.900	702.3	1023168.314	1893148.976	702.158	0.014	0.076	-0.142	
5	R5a-6-T5	1023165.800	1893140.900				703.166	-0.042	0.088	0.866	Tronox directed to take all material as targeted
5	R5a-6-T6	1023137.400	1893128.200	703.1	1023137.359	1893128.211	702.959	-0.041	0.011	-0.141	_

Notes:

 Δ Elevation > 0.5 ft Blue Δ Easting/Northing < or = 0.2 ft Green Δ Elevation 0.5 to -0.25 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment D

Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-6

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design			Actual				ata Compar		Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	△ Northing	∆ Elevation	
5	R5a-6-T7	1023161.500	1893127.800	703.5	1023160.455	1893129.833	703.288	-1.045	2.033	-0.212	Pt. moved towards 11958 to achieve design elev.
5	R5a-6-T8	1023163.400	1893119.500	700.5	1023163.320	1893119.578	700.828	-0.080	0.078	0.328	
5	R5a-6-T9	1023137.600	1893115.800	704.0	1023137.604	1893115.763	704.165	0.004	-0.037	0.165	

Notes:

 $\begin{array}{ll} \Delta \; \text{Elevation} > 0.5 \; \text{ft Blue} & \Delta \; \text{Easting/Northing} < \text{or} = 0.2 \; \text{ft Green} \\ \Delta \; \text{Elevation} \; 0.5 \; \text{to} \; -0.25 \; \text{ft Green} & \Delta \; \text{Easting/Northing} > 0.2 \; \text{ft Blue} \\ \end{array}$

Attachment D Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-7

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design				Actual		Da	ta Compari	sion	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-7-11980t	1023156.300	1893069.300	699.3	1023156.288	1893069.181	700.028	-0.012	-0.119	0.728	Tronox directed to take all material as targeted
5	R5a-7-T1	1023152.200	1893074.200	699.3	1023152.166	1893074.241	700.309	-0.034	0.041	1.009	Tronox directed to take all material as targeted
5	R5a-7-T2	1023160.800	1893072.900	699.3	1023160.867	1893072.841	699.963	0.067	-0.059	0.663	Tronox directed to take all material as targeted
5	R5a-7-T3	1023160.100	1893068.200	699.3	1023160.095	1893068.293	699.893	-0.005	0.093	0.593	Tronox directed to take all material as targeted
5	R5a-7-T4	1023151.400	1893065.500	699.3	1023151.462	1893065.591	700.128	0.062	0.091	0.828	Tronox directed to take all material as targeted
5	R5a-7-T5	1023155.700	1893064.900	699.3	1023155.599	1893064.981	700.042	-0.101	0.081	0.742	Tronox directed to take all material as targeted

Notes:

 Δ Elevation > 0.5 ft Blue Δ Easting/Northing < or = 0.2 ft Green Δ Elevation 0.5 to -0.25 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment D
Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-8

		Design				Actual		D	ata Compar	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-8-11978t	1023144.200	1893079.900	GS	1023144.185	1893079.932	702.730	-0.015	0.032	NA	
5	R5a-8-11982t	1023143.900	1893071.300	GS	1023143.873	1893071.267	703.561	-0.027	-0.033	NA	
5	R5a-8-11984t	1023144.100	1893055.800	GS	1023144.113	1893055.850	702.256	0.013	0.050	NA	
5	R5a-8-12007t	1023138.000	1893043.700	GS	1023138.056	1893043.733	703.786	0.056	0.033	NA	
5	R5a-8-15041t	1023136.500	1893082.400	703.1	1023136.512	1893082.338	703.161	0.012	-0.062	0.061	
5	R5a-8-T1	1023135.100	1893091.900	703.1	1023135.043	1893091.961	703.009	-0.057	0.061	-0.091	
5	R5a-8-T10	1023138.300	1893065.600	GS	1023138.327	1893065.612	706.743	0.027	0.012	NA	
5	R5a-8-T11	1023145.800	1893063.300	GS	1023145.840	1893063.291	701.375	0.040	-0.009	NA	
5	R5a-8-T12	1023138.400	1893057.800	GS	1023138.443	1893057.778	705.760	0.043	-0.022	NA	
5	R5a-8-T13	1023135.400	1893051.800	GS	1023135.369	1893051.809	705.405	-0.031	0.009	NA	
5	R5a-8-T14	1023143.800	1893050.900	GS	1023143.785	1893050.855	702.060	-0.015	-0.045	NA	
5	R5a-8-T15	1023129.600	1893045.800		1023129.653			0.053	-0.091	NA	
5	R5a-8-T16	1023140.700	1893044.900	GS	1023140.718	1893044.831	702.779	0.018	-0.069	NA	
5	R5a-8-T17	1023140.700	1893043.000	GS	1023140.752	1893042.970	702.938	0.052	-0.030	NA	
	R5a-8-T18		1893042.400		1023127.937			0.037	0.022	NA	
5	R5a-8-T2	1023139.100	1893091.300	703.1	1023139.166	1893091.314	702.951	0.066	0.014	-0.149	
	R5a-8-T3		1893085.400		1023141.564				-0.061	-0.140	
5	R5a-8-T4	1023145.500	1893084.100	GS	1023145.461	1893084.090	702.815	-0.039	-0.010	NA	
5	R5a-8-T5	1023132.600	1893082.900	703.1	1023132.658	1893082.949	703.133	0.058	0.049	0.033	
5	R5a-8-T6	1023146.200	1893079.500	GS	1023146.160	1893079.430	701.789	-0.040	-0.070	NA	
5	R5a-8-T7	1023132.700	1893078.700	703.1	1023132.703	1893078.609	703.245	0.003	-0.091	0.145	<u>-</u>
5	R5a-8-T8	1023136.400	1893073.100	GS	1023136.424	1893073.067	707.335	0.024	-0.033	NA	<u> </u>
5	R5a-8-T9	1023145.900	1893070.900	GS	1023145.981	1893070.965	701.593	0.081	0.065	NA	

Notes:

 $\overline{\Delta}$ Elevation > 0.16 ft Blue Δ Easting/Northing < or = 0.2 ft Green Δ Elevation 0.16 to -0.16 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment D Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-9

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design				Actual		D	ata Compar	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting		Elevation	∆ Easting	△ Northing	∆ Elevation	
5	R5a-9-12005t	1023154.000	1893044.100	GS			700.617	-0.105	-0.026	NA	
	R5a-9-12009t			GS			700.241	-0.102	0.051	NA	
	R5a-9-12010t			GS			700.355	-0.013	0.011	NA	
	R5a-9-12011t			GS			700.886	-0.125	0.024	NA	
5	R5a-9-12012t	1023142.000	1893024.000	GS	1023141.918	1893024.010	701.611	-0.082	0.010	NA	
5	R5a-9-12030t	1023129.400	1893026.500	GS			703.657	0.034	-0.018	NA	
5	R5a-9-12032t	1023142.800	1893014.000	GS	1023142.853	1893014.102	700.568	0.053	0.102	NA	
5	R5a-9-12033t	1023138.300	1893014.800	GS	1023138.192	1893014.771	702.578	-0.108	-0.029	NA	
5	R5a-9-12038t	1023131.000	1892992.900	701.9	1023130.933	1892992.788	701.966	-0.067	-0.112	0.066	
5	R5a-9-12039t	1023130.500	1893017.100	GS	1023130.568	1893017.153	703.269	0.068	0.053	NA	
5	R5a-9-12040t	1023123.500	1893018.600	703.1	1023123.399	1893018.667	703.611	-0.101	0.067	0.511	Tronox directed to take all material as targeted
5	R5a-9-12041t	1023128.000	1893010.600	GS	1023127.956	1893010.553	703.805	-0.044	-0.047	NA	-
5	R5a-9-12042t	1023112.400	1893014.100	703.0	1023112.404	1893013.984	704.504	0.004	-0.116	1.504	Tronox directed to take all material as targeted
5	R5a-9-12044t	1023132.700	1893001.400	GS	1023132.706	1893001.512	703.624	0.006	0.112	NA	
5	R5a-9-12045t	1023126.700	1893004.600	GS	1023126.681	1893004.572	703.455	-0.019	-0.028	NA	
5	R5a-9-12046t	1023118.500	1893005.200	GS	1023118.595	1893005.319	704.402	0.095	0.119	NA	
5	R5a-9-12082t	1023127.500	1892984.300	GS	1023127.433	1892984.406	700.720	-0.067	0.106	NA	
5	R5a-9-12089t	1023124.100	1892966.600	GS	1023124.124	1892966.614	703.025	0.024	0.014	NA	
5	R5a-9-12091t	1023124.200	1892959.800	GS	1023124.180	1892959.810	703.057	-0.020	0.010	NA	
5	R5a-9-12095t	1023116.400	1892971.500	GS	1023116.486	1892971.457	703.559	0.086	-0.043	NA	
5	R5a-9-12119t	1023117.500	1892979.200	GS	1023117.424	1892979.234	703.616	-0.076	0.034	NA	
5	R5a-9-15031t	1023120.400	1893028.500	704.8	1023120.430	1893028.500	704.874	0.030	0.000	0.074	
5	R5a-9-T1	1023154.400	1893048.500	GS	1023154.335	1893048.422	700.274	-0.065	-0.078	NA	
5	R5a-9-T10	1023136.800	1893028.000	GS	1023136.827	1893027.995	703.396	0.027	-0.005	NA	
5	R5a-9-T11	1023146.400	1893027.100	GS	1023146.436	1893027.202	700.561	0.036	0.102	NA	
5	R5a-9-T12	1023118.100	1893024.400	704.8	1023118.120	1893024.397	704.994	0.020	-0.003	0.194	
5	R5a-9-T13	1023120.000	1893019.600	703.1	1023120.017	1893019.511	703.988	0.017	-0.089	0.888	Tronox directed to take all material as targeted
5	R5a-9-T14	1023156.400	1893018.700	GS	1023156.461	1893018.591	700.449	0.061	-0.109	NA	
5	R5a-9-T15	1023114.500	1893017.400	703.0	1023114.575	1893017.416	704.508	0.075	0.016	1.508	Tronox directed to take all material as targeted
5	R5a-9-T16	1023122.700	1893015.300	703.1	1023122.698	1893015.257	703.738	-0.002	-0.043	0.638	Tronox directed to take all material as targeted
	R5a-9-T17	1023125.800		GS			703.474	-0.043	-0.023	NA	
5	R5a-9-T18	1023117.100	1893013.000	703.0	1023117.080	1893012.957	704.180	-0.020	-0.043	1.180	Tronox directed to take all material as targeted
5	R5a-9-T19	1023147.200	1893013.000	GS	1023147.300	1893012.951	700.159	0.100	-0.049	NA	
5	R5a-9-T2	1023158.500	1893047.600	GS	1023158.418	1893047.585	700.470	-0.082	-0.015	NA	
5	R5a-9-T20	1023137.100	1893010.900	GS	1023137.042	1893010.862	702.757	-0.058	-0.038	NA	
5	R5a-9-T21	1023110.300	1893010.700	703.0	1023110.298	1893010.619	704.440	-0.002	-0.081	1.440	Tronox directed to take all material as targeted
5	R5a-9-T22	1023145.100	1893010.100	GS	1023145.158	1893010.106	700.291	0.058	0.006	NA	

Notes:

 Δ Elevation > 0.5 ft Blue

 Δ Easting/Northing < or = 0.2 ft Green

 Δ Elevation 0.5 to -0.25 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment D
Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-9

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design				Actual		Da	ata Compar	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation			∆ Elevation	
5	R5a-9-T23	1023131.900	1893008.800	GS	1023131.898	1893008.684	703.358	-0.002	-0.116	NA	
5	R5a-9-T24	1023120.200	1893008.600	GS	1023120.165	1893008.681	703.890	-0.035	0.081	NA	
5	R5a-9-T25	1023124.300	1893008.300	GS	1023124.295	1893008.381	703.680	-0.005	0.081	NA	
5	R5a-9-T26	1023113.300	1893006.300	GS	1023113.324	1893006.338	704.024	0.024	0.038	NA	
5	R5a-9-T27	1023118.400	1893001.700	GS	1023118.323	1893001.673	703.645	-0.077	-0.027	NA	
5	R5a-9-T28	1023134.600	1893000.900	GS	1023134.625	1893000.965	703.185	0.025	0.065	NA	
5	R5a-9-T29	1023125.100	1893000.100	GS	1023125.188	1893000.209	703.129	0.088	0.109	NA	
5	R5a-9-T3	1023148.700	1893045.100	GS	1023148.600	1893045.043	700.616	-0.100	-0.057	NA	
5	R5a-9-T30	1023133.700	1892996.600	701.9	1023133.605	1892996.626	702.173	-0.095	0.026	0.273	
5	R5a-9-T31	1023127.300	1892994.200	701.9	1023127.441	1892994.346	703.059	0.141	0.146	1.159	Tronox directed to take all material as targeted
5	R5a-9-T32	1023132.900	1892992.100	701.9	1023131.038	1892992.855	702.018	-1.862	0.755	0.118	Pt. moved towards 12038 to achieve design elev.
5	R5a-9-T33	1023122.800	1892987.200	GS	1023122.781	1892987.332	702.934	-0.019	0.132	NA	_
5	R5a-9-T34	1023130.000	1892984.400	GS	1023129.957	1892984.340	700.132	-0.043	-0.060	NA	
5	R5a-9-T35	1023114.200	1892981.400	GS	1023114.236	1892981.438	703.734	0.036	0.038	NA	
5	R5a-9-T36	1023127.100	1892980.400	GS	1023127.084	1892980.446	700.844	-0.016	0.046	NA	
5	R5a-9-T37	1023122.100	1892977.800	GS	1023122.155	1892977.850	703.442	0.055	0.050	NA	
5	R5a-9-T38	1023112.400	1892973.800	GS	1023112.436	1892973.948	703.727	0.036	0.148	NA	
5	R5a-9-T39	1023112.200	1892968.700	GS	1023112.179	1892968.751	703.783	-0.021	0.051	NA	
5	R5a-9-T4	1023158.500	1893043.500	GS	1023158.390	1893043.558	700.435	-0.110	0.058	NA	
5	R5a-9-T40	1023126.600	1892966.400	GS	1023126.515	1892966.466	701.097	-0.085	0.066	NA	
5	R5a-9-T41	1023119.200	1892964.900	GS	1023119.193	1892964.963	703.312	-0.007	0.063	NA	
5	R5a-9-T42	1023126.000	1892959.200	GS	1023125.900	1892959.142	700.937	-0.100	-0.058	NA	
5	R5a-9-T43	1023118.800	1892957.300	GS	1023118.838	1892957.388	703.439	0.038	0.088	NA	
5	R5a-9-T44	1023123.700	1892955.600	GS	1023123.734	1892955.601	702.741	0.034	0.001	NA	
5	R5a-9-T5	1023148.400	1893035.500	GS	1023148.328	1893035.554	700.384	-0.072	0.054	NA	
5	R5a-9-T6	1023157.400	1893033.800	GS	1023157.473	1893033.916	700.536	0.073	0.116	NA	
5	R5a-9-T7	1023137.100	1893032.800	GS	1023137.046	1893032.674	703.848	-0.054	-0.126	NA	
5	R5a-9-T8	1023127.200	1893032.400	GS	1023127.186	1893032.349	704.281	-0.014	-0.051	NA	
5	R5a-9-T9	1023120.100	1893032.100	704.8	1023120.116	1893032.170	705.952	0.016	0.070	1.152	Tronox directed to take all material as targeted

Notes:

 $\begin{array}{ll} \Delta \; \text{Elevation} > 0.5 \; \text{ft Blue} & \Delta \; \text{Easting/Northing} < \text{or} = 0.2 \; \text{ft Green} \\ \Delta \; \text{Elevation} \; 0.5 \; \text{to} \; -0.25 \; \text{ft Green} & \Delta \; \text{Easting/Northing} > 0.2 \; \text{ft Blue} \\ \end{array}$

Attachment D Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-10

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design				D	ata Compar	ison	Comments		
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	△ Northing	∆ Elevation	
5	R5a-10-12130	1023111.500	1892892.200	GS	1023111.487	1892892.238	702.347	-0.013	0.038	NA	
5	R5a-10-12131	1023099.600	1892898.900	GS	1023099.582	1892898.816	703.851	-0.018	-0.084	NA	
5	R5a-10-T1	1023101.500	1892902.800	GS	1023101.493	1892902.707	703.777	-0.007	-0.093	NA	
5	R5a-10-T2	1023096.300	1892900.800	GS	1023096.331	1892900.727	703.769	0.031	-0.073	NA	
5	R5a-10-T3	1023106.900	1892899.100	GS	1023106.913	1892899.106	704.138	0.013	0.006	NA	
5	R5a-10-T4	1023095.700	1892897.300	GS	1023095.650	1892897.247	703.840	-0.050	-0.053	NA	
5	R5a-10-T5	1023114.000	1892895.000	GS	1023114.001	1892895.019	701.825	0.001	0.019	NA	
5	R5a-10-T6	1023104.100	1892893.800	GS	1023104.151	1892893.789	703.930	0.051	-0.011	NA	
5	R5a-10-T7	1023111.800	1892890.200	GS	1023111.844	1892890.203	701.483	0.044	0.003	NA	

Notes:

 Δ Elevation > 0.16 ft Blue Δ Easting/Northing < or = 0.2 ft Green

 \triangle Elevation 0.16 to -0.16 ft Green \triangle Easting/Northing > 0.2 ft Blue

Attachment D
Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-11

		Design				Actual		C	ata Compa	rison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-11-12166	1022918.400	1892751.200	GS	1022918.403	1892751.253	702.384	0.003	0.053	NA	
5	R5a-11-12169	1022920.100	1892739.800	702.0	1022920.123	1892739.776	702.117	0.023	-0.024	0.117	
5	R5a-11-12170	1022910.000	1892746.000	GS	1022910.009	1892746.045	702.844	0.009	0.045	NA	
5	R5a-11-12175	1022911.500	1892726.400	GS	1022911.448	1892726.493	702.312	-0.052	0.093	NA	
5	R5a-11-12176	1022904.000	1892730.400	GS	1022904.021	1892730.491	702.709	0.021	0.091	NA	
5	R5a-11-12177	1022902.800	1892712.800	GS	1022902.780	1892712.848	702.141	-0.020	0.048	NA	
5	R5a-11-12206	1022914.300	1892705.400	GS	1022914.218	1892705.349	702.822	-0.082	-0.051	NA	
5	R5a-11-12207	1022892.300	1892718.400	GS	1022892.250	1892718.287	702.889	-0.050	-0.113	NA	
5	R5a-11-12209	1022915.400	1892693.800	702.2	1022915.409	1892693.832	702.147	0.009	0.032	-0.053	
5	R5a-11-12211	1022909.700	1892689.000	GS	1022909.773	1892689.003	702.763	0.073	0.003	NA	
5	R5a-11-12212	1022904.100	1892692.200	GS	1022904.040	1892692.207	702.533	-0.060	0.007	NA	
5	R5a-11-12213	1022892.900	1892699.900	GS	1022892.779	1892699.851	702.738	-0.121	-0.049	NA	
5	R5a-11-12214	1022885.800	1892705.400	GS	1022885.809	1892705.413	702.657	0.009	0.013	NA	
5	R5a-11-12216	1022897.100	1892678.600	GS	1022897.062	1892678.545	701.896	-0.038	-0.055	NA	
5	R5a-11-12217	1022883.400	1892688.100	GS	1022883.409	1892688.079	702.434	0.009	-0.021	NA	
5	R5a-11-12218	1022875.000	1892673.400	GS	1022874.965	1892673.398	702.612	-0.035	-0.002	NA	
5	R5a-11-12220	1022902.000	1892672.600	701.9	1022901.976	1892672.537	702.032	-0.024	-0.063	0.132	
5	R5a-11-12226	1022894.700	1892660.200	GS	1022894.690	1892660.132	702.551	-0.010	-0.068	NA	
5	R5a-11-12227	1022887.900	1892664.800	GS	1022887.726	1892664.806	702.346	-0.174	0.006	NA	
5	R5a-11-12231	1022880.100	1892650.500	GS	1022879.973	1892650.491	702.547	-0.127	-0.009	NA	
5	R5a-11-12232	1022865.400	1892661.300	GS	1022865.323	1892661.404	702.998	-0.077	0.104	NA	
5	R5a-11-12233	1022871.600	1892635.600	GS	1022871.482	1892635.582	702.441	-0.118	-0.018	NA	
5	R5a-11-12255	1022878.300	1892631.400	GS	1022878.189	1892631.361	702.588	-0.111	-0.039	NA	
5	R5a-11-12256	1022864.400	1892640.100	GS	1022864.309	1892640.015	702.834	-0.091	-0.085	NA	
5	R5a-11-12258	1022862.100	1892620.300	GS	1022862.019	1892620.357	702.585	-0.081	0.057	NA	
5	R5a-11-12261	1022853.200	1892606.100	GS	1022853.219	1892606.052	702.332	0.019	-0.048	NA	
5	R5a-11-12263	1022855.500	1892623.600	GS	1022855.354	1892623.522	702.771	-0.146	-0.078	NA	
5	R5a-11-12265	1022844.600	1892609.600	GS	1022844.575	1892609.668	702.434	-0.025	0.068	NA	
5	R5a-11-12268	1022844.500	1892591.700	701.6	1022844.559	1892591.631	701.706	0.059	-0.069	0.106	
5	R5a-11-12271	1022836.600	1892594.300	GS	1022836.583	1892594.247	702.075	-0.017	-0.053	NA	
5	R5a-11-12273	1022831.700	1892587.200	GS	1022831.706	1892587.160	702.131	0.006	-0.040	NA	
5	R5a-11-12278	1022819.300	1892583.500	GS	1022819.285	1892583.472	703.328	-0.015	-0.028	NA	
5	R5a-11-15046	1022912.000	1892756.400	703.7	1022911.919	1892756.447	703.745	-0.081	0.047	0.045	
5	R5a-11-15048	1022897.800	1892735.100	702.4	1022897.865	1892735.150	702.547	0.065	0.050	0.147	
5	R5a-11-15052	1022885.700	1892746.800	703.7	1022885.652	1892746.752	703.815	-0.048	-0.048	0.115	
5	R5a-11-15053	1022873.600	1892735.000	703.5	1022873.566	1892735.027	703.602	-0.034	0.027	0.102	
5	R5a-11-15054			703.0	1022879.420	1892710.591	702.999	0.020	-0.009	-0.001	

Notes:

 Δ Elevation > 0.16 ft Blue Δ Easting/Northing < or = 0.2 ft Green

 \triangle Elevation 0.16 to -0.16 ft Green \triangle Easting/Northing > 0.2 ft Blue

Attachment D
Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-11

		Design				Actual			Data Compa		Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-11-15055	1022876.800	1892691.700	702.2	1022876.775	1892691.738	702.152	-0.025	0.038	-0.048	
5	R5a-11-15066	1022870.200	1892727.600	703.8	1022870.310	1892727.677	703.671	0.110	0.077	-0.129	
5	R5a-11-15138	1022903.600	1892750.600	703.0	1022903.562	1892750.465	703.152	-0.038	-0.135	0.152	
5	R5a-11-15140	1022888.300	1892723.900	702.9	1022888.286	1892723.859	703.025	-0.014	-0.041	0.125	
5	R5a-11-T1	1022904.800	1892762.900	703.7	1022904.725	1892762.892	703.681	-0.075	-0.008	-0.019	
5	R5a-11-T10	1022866.500	1892731.800	703.8	1022866.471	1892731.847	703.838	-0.029	0.047	0.038	
5	R5a-11-T11	1022919.400	1892730.800	GS	1022919.455	1892730.823	702.704	0.055	0.023	NA	
5	R5a-11-T12	1022919.700	1892725.900	GS	1022919.610	1892725.926	702.411	-0.090	0.026	NA	
5	R5a-11-T13	1022868.300	1892724.700	703.8	1022868.360		703.703	0.060	-0.050	-0.097	
5	R5a-11-T14	1022874.800	1892719.100	703.0	1022874.861	1892719.101	703.084	0.061	0.001	0.084	
5	R5a-11-T15	1022912.700	1892715.700	GS	1022912.617	1892715.789	702.358	-0.083	0.089	NA	
5	R5a-11-T16	1022922.300	1892709.400	GS		1892709.443	703.042	0.041	0.043	NA	
5	R5a-11-T17	1022870.900	1892707.500	703.0	1022870.810	1892707.469	703.024	-0.090	-0.031	0.024	
5		1022917.500		GS		1892702.827	702.897	0.028	0.027	NA	
5	R5a-11-T19	1022869.600	1892698.100	702.2	1022869.603	1892698.005	702.340		-0.095	0.140	
5	R5a-11-T2	1022915.000	1892758.700	703.7	1022914.932	1892758.637	703.798	-0.068	-0.063	0.098	
5			1892691.600	702.2	1022918.625	1892691.718	702.323	-0.075	0.118	0.123	
5			1892686.900	702.2	1022877.891	1892686.930	702.274	-0.109	0.030	0.074	
5	R5a-11-T22	1022913.500	1892685.900	GS	1022913.496	1892685.895	702.851	-0.004	-0.005	NA	
5			1892677.700				701.923		-0.013	0.023	
5			1892676.200						-0.032	NA	
5			1892670.500			1892670.494	702.004		-0.006	0.104	
5			1892666.800				702.949		-0.051	NA	
5			1892664.400		1022901.337		702.522	-0.063	-0.037	NA	
5			1892661.700	GS	1022863.015	1892661.607	703.086		-0.093	NA	
5		1022897.700				1892658.149	702.538		-0.051	NA	
5			1892757.000	703.0		1892756.872	703.123	0.056	-0.128	0.123	
5		1022892.500		GS		1892656.617	702.575		-0.083	NA	
5		1022885.200			1022885.103	1892651.758		-0.097	-0.042	NA	
5		1022862.900			1022862.779	1892647.580	702.901	-0.121	-0.020	NA	
5			1892644.200		1022881.275				-0.017	NA	
5			1892642.200		1022860.675				0.000	NA	
5			1892636.700			1892636.728			0.028	NA	
5		1022856.200			1022856.215	1892634.030			0.030	NA	
5			1892631.900						-0.172	NA	
5			1892628.700	GS			702.818		-0.063	NA	
5	R5a-11-T39	1022851.300	1892624.800	GS	1022851.127	1892624.686	702.764	-0.173	-0.114	NA	

Notes:

 Δ Elevation > 0.16 ft Blue Δ Easting/Northing < or = 0.2 ft Green

 \triangle Elevation 0.16 to -0.16 ft Green \triangle Easting/Northing > 0.2 ft Blue

Δ Elevation < -0.16 ft Red

Attachment D
Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-11

		Design			Actual				ata Compar		Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	<u>∆</u> Easting	∆ Northing	∆ Elevation	
5	R5a-11-T40	1022922.000	1892753.600	GS	1022922.005	1892753.667	702.722	0.005	0.067	NA	
5	R5a-11-T41	1022874.000	1892623.800	GS	1022873.916	1892623.643	702.558	-0.084	-0.157	NA	
5	R5a-11-T42	1022865.900	1892618.200	GS	1022865.819	1892618.024	702.626	-0.081	-0.176	NA	
5	R5a-11-T43	1022845.800	1892617.800	GS	1022845.771	1892617.740	702.676	-0.029	-0.060	NA	
5	R5a-11-T44	1022841.300	1892611.600	GS	1022841.357	1892611.686	702.681	0.057	0.086	NA	
5	R5a-11-T45	1022861.600	1892611.000	GS	1022861.487	1892610.969	702.647	-0.113	-0.031	NA	
5	R5a-11-T46	1022837.300	1892604.000	GS	1022837.340	1892604.054	702.416	0.040	0.054	NA	
5	R5a-11-T47	1022857.000	1892604.000	GS	1022857.000	1892604.066	702.287	0.000	0.066	NA	
5	R5a-11-T48	1022852.200	1892596.700	701.6	1022852.131	1892596.667	701.657	-0.069	-0.033	0.057	
5	R5a-11-T49	1022832.700	1892595.800	GS	1022832.674	1892595.810	702.379	-0.026	0.010	NA	
5	R5a-11-T5	1022828.100	1892589.500	GS	1022828.056	1892589.605	702.926	-0.044	0.105	NA	
5	R5a-11-T50	1022896.900	1892752.900	703.0	1022896.868	1892752.823	703.116	-0.032	-0.077	0.116	
5	R5a-11-T51	1022847.800	1892589.500	701.6	1022847.747	1892589.524	701.653	-0.053	0.024	0.053	
5	R5a-11-T52	1022818.200	1892588.900	GS	1022818.183	1892588.884	703.324	-0.017	-0.016	NA	
5	R5a-11-T53	1022821.900	1892587.600	GS	1022821.827	1892587.620	702.997	-0.073	0.020	NA	
5	R5a-11-T54	1022836.900	1892584.900	GS	1022836.854	1892584.877	702.259	-0.046	-0.023	NA	
5	R5a-11-T55	1022815.600	1892584.800	GS	1022815.508	1892584.729	706.443	-0.092	-0.071	NA	
5	R5a-11-T56	1022823.100	1892581.400	GS	1022823.098	1892581.444	702.607	-0.002	0.044	NA	
5	R5a-11-T57	1022816.800	1892580.000	GS	1022816.787	1892579.966	703.578	-0.013	-0.034	NA	
5	R5a-11-T6	1022820.900	1892577.700	GS	1022820.953	1892577.731	702.781	0.053	0.031	NA	
5	R5a-11-T7	1022881.500	1892749.600	703.7	1022881.428	1892749.662	703.839	-0.072	0.062	0.139	
5	R5a-11-T8	1022922.600	1892748.400	GS	1022922.672	1892748.457	702.477	0.072	0.057	NA	
5	R5a-11-T9	1022870.100	1892738.400	703.5	1022870.044	1892738.429	703.509	-0.056	0.029	0.009	
5	R5a-11-V5t	1022923.700	1892737.500	702.0	1022923.684	1892737.436	702.153	-0.016	-0.064	0.153	
5		1022887.100	1892734.700	703.3	1022887.104	1892734.705	703.425	0.004	0.005	0.125	

Notes:

 Δ Elevation > 0.16 ft Blue Δ Easting/Northing < or = 0.2 ft Green

 Δ Elevation 0.16 to -0.16 ft Green Δ Easting/Northing > 0.2 ft Blue

Δ Elevation < -0.16 ft Red

Attachment D
Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-12

		Design			Actual			Data Comparison			Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-12-9507t	1022328.800	1891780.200	700.2	1022328.788	1891780.198	700.887	-0.012	-0.002	0.687	Tronox directed to take all material as targeted
5	R5a-12-9566t	1022333.500	1891795.900	700.1	1022333.458	1891795.859	700.717	-0.042	-0.041	0.617	Tronox directed to take all material as targeted
5	R5a-12-9572t	1022321.300	1891766.000	GS	1022321.345	1891766.031	700.668	0.045	0.031	NA	
5	R5a-12-9573t	1022318.100	1891767.400	700.0	1022318.152	1891767.341	702.197	0.052	-0.059	2.197	Tronox directed to take all material as targeted
5	R5a-12-9652t	1022322.100	1891773.900	700.7	1022322.033	1891773.840	702.332	-0.067	-0.060	1.632	Tronox directed to take all material as targeted
5	R5a-12-T1	1022335.300	1891799.600	700.1	1022335.341	1891799.588	700.519	0.041	-0.012	0.419	
5	R5a-12-T10	1022322.500	1891769.400	GS	1022322.558	1891769.357	700.898	0.058	-0.043	NA	
5	R5a-12-T11	1022314.000	1891768.800	700.0	1022314.003	1891768.856	703.469	0.003	0.056	3.469	Tronox directed to take all material as targeted
5	R5a-12-T12	1022313.600	1891764.800	700.0	1022313.700	1891764.783	702.983	0.100	-0.017	2.983	Tronox directed to take all material as targeted
5	R5a-12-T13	1022324.900	1891763.000	GS	1022324.886	1891762.954	700.199	-0.014	-0.046	NA	
5	R5a-12-T14	1022319.300	1891762.800	GS	1022319.271	1891762.741	701.242	-0.029	-0.059	NA	
5	R5a-12-T2	1022332.600	1891796.000	700.1	1022332.592	1891796.015	702.903	-0.008	0.015	2.803	Tronox directed to take all material as targeted
5	R5a-12-T3	1022337.200	1891794.300	700.1	1022337.173	1891794.184	700.180	-0.027	-0.116	0.080	
5	R5a-12-T4	1022330.300	1891788.200	700.2	1022330.232	1891788.224	701.915	-0.068	0.024	1.715	Tronox directed to take all material as targeted
5	R5a-12-T5	1022334.900	1891786.500	700.2	1022334.918	1891786.499	700.456	0.018	-0.001	0.256	
5	R5a-12-T6	1022327.400	1891780.700	700.2	1022327.363	1891780.690	701.957	-0.037	-0.010	1.757	Tronox directed to take all material as targeted
5	R5a-12-T7	1022331.700	1891778.900	700.2	1022331.717	1891778.923	700.443	0.017	0.023	0.243	
5	R5a-12-T8	1022319.200	1891775.700	700.7	1022319.259	1891775.689	703.084	0.059	-0.011	2.384	Tronox directed to take all material as targeted
5	R5a-12-T9	1022322.900	1891773.300	700.7	1022322.882	1891773.301	702.088	-0.018	0.001	1.388	Tronox directed to take all material as targeted

Notes:

 $\begin{array}{ll} \hline \Delta \ \, \text{Elevation} > 0.5 \ \, \text{ft Blue} & \Delta \ \, \text{Easting/Northing} < \text{or} = 0.2 \ \, \text{ft Green} \\ \Delta \ \, \text{Elevation} \ \, 0.5 \ \, \text{to} \ \, -0.25 \ \, \text{ft Green} & \Delta \ \, \text{Easting/Northing} > 0.2 \ \, \text{ft Blue} \\ \end{array}$

Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-13

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design			Actual			Data Comparison			Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	△ Northing	∆ Elevation	
5	R5a-13-9649t	1022332.800	1891763.800	GS	1022332.776	1891763.776	699.516	-0.024	-0.024	NA	
5	R5a-13-T1	1022334.400	1891767.200	GS	1022334.428	1891767.168	699.307	0.028	-0.032	NA	
5	R5a-13-T2	1022330.400	1891764.000	GS	1022330.417	1891764.027	699.855	0.017	0.027	NA	
5	R5a-13-T3	1022338.900	1891762.000	GS	1022338.909	1891762.011	698.949	0.009	0.011	NA	
5	R5a-13-T4	1022333.800	1891760.100	GS	1022333.866	1891760.103	699.275	0.066	0.003	NA	
5	R5a-13-T5	1022336.800	1891760.000	GS	1022336.852	1891759.985	698.993	0.052	-0.015	NA	

Notes:

 Δ Elevation > 0.5 ft Blue Δ Elevation 0.5 to -0.25 ft Green Δ Elevation 0.5 to -0.25 ft Green Δ Easting/Northing > 0.2 ft Blue

 Δ Elevation < -0.25 ft Red

Comprehensive GPS Verification Survey for the Bottom of Overburden - Reach 5A-14

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design			Actual			Data Comparison			Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-14-9503t	1022316.500	1891750.400	GS	1022316.451	1891750.382	701.873	-0.049	-0.018	NA	
5	R5a-14-T1	1022316.900	1891755.000	GS	1022316.899	1891754.986	702.117	-0.001	-0.014	NA	
5	R5a-14-T2	1022313.000	1891754.800	GS	1022313.019	1891754.771	702.189	0.019	-0.029	NA	
5	R5a-14-T3	1022317.800	1891750.400	GS	1022317.853	1891750.378	701.141	0.053	-0.022	NA	
5	R5a-14-T4	1022312.600	1891750.300	GS	1022312.637	1891750.250	702.183	0.037	-0.050	NA	
5	R5a-14-T5	1022317.200	1891745.400	GS	1022317.142	1891745.411	701.200	-0.058	0.011	NA	
5	R5a-14-T6	1022313.300	1891745.300	GS	1022313.370	1891745.409	702.248	0.070	0.109	NA	

Notes:

 Δ Elevation > 0.5 ft Blue Δ Elevation 0.5 to -0.25 ft Green Δ Elevation 0.5 to -0.25 ft Green Δ Easting/Northing > 0.2 ft Blue

 Δ Elevation < -0.25 ft Red



Appendix E

Comprehensive GPS Verification Survey for the Bottom of Targeted Material – Reach 5A

Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-1

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design			Actual			Da	ata Compar	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	△ Northing	∆ Elevation	
5	R5a-1-11849b	1023199.800	1893497.200	703.3	1023199.862	1893497.281	703.273	0.062	0.081	-0.027	
5	R5a-1-B1	1023205.700	1893504.200	703.3	1023205.698	1893504.061	702.950	-0.002	-0.139	-0.350	
5	R5a-1-B2	1023199.100	1893501.900	703.3	1023199.098	1893501.840	703.288	-0.002	-0.060	-0.012	
5	R5a-1-B3	1023195.700	1893497.700	703.3	1023195.772	1893497.733	703.266	0.072	0.033	-0.034	
5	R5a-1-B4	1023204.000	1893496.200	703.3	1023200.868	1893496.695	703.274	-3.132	0.495	-0.026	Pt. moved towards 11849 to achieve design elev.
5	R5a-1-B5	1023200.300	1893494.800	703.3	1023200.335	1893494.774	703.287	0.035	-0.026	-0.013	

Notes:

 Δ Elevation < -0.16 ft Blue

 Δ Easting/Northing < or = 0.2 ft Green

 \triangle Elevation -0.16 to 0.0 ft Green \triangle Easting/Northing > 0.2 ft Blue

Attachment E
Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-2

		Design				Actual		D	ata Compar	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	△ Northing	∆ Elevation	
5	R5a-2-11814b	1023216.700	1893446.300	699.5	1023216.681	1893446.295	699.461	-0.019	-0.005	-0.039	
5	R5a-2-11815b	1023207.500	1893446.400	700	1023207.524	1893446.409	699.960	0.024	0.009	-0.040	
5	R5a-2-11816b	1023204.500	1893446.500	700.6	1023204.513	1893446.510	700.543	0.013	0.010	-0.057	
5	R5a-2-11819b	1023206.500	1893438.100	700.5	1023206.520	1893438.103	700.496	0.020	0.003	-0.004	
5	R5a-2-11858b	1023220.400	1893456.000	699.1	1023220.347	1893455.951	698.978	-0.053	-0.049	-0.122	
5	R5a-2-15030b	1023195.900	1893446.200	702.9	1023195.901	1893446.200	702.783	0.001	0.000	-0.117	
5	R5a-2-B1		1893460.300		1023215.146			-0.054	-0.016	-0.006	
5	R5a-2-B10		1893443.200		1023191.073	1893443.158	702.847	-0.027	-0.042	-0.053	
	R5a-2-B11		1893442.600		1023196.410			0.010	0.096	-0.036	
	R5a-2-B12		1893442.200		1023204.298		700.539	-0.002	-0.039	-0.061	
5	R5a-2-B13	1023210.700	1893442.100	700	1023210.690	1893442.067		-0.010	-0.033	-0.272	
5	R5a-2-B14	1023215.300	1893442.000	699.5	1023215.295	1893442.055	699.490	-0.005	0.055	-0.010	
	R5a-2-B15	1023210.200	1893437.900	700.5	1023210.203	1893437.877	700.351	0.003	-0.023	-0.149	
5	R5a-2-B16	1023205.900	1893434.600	700.5	1023205.959	1893434.620	700.405	0.059	0.020	-0.095	
5	R5a-2-B2	1023222.700	1893459.300	699.1	1023222.640			-0.060	0.025	-0.010	
	R5a-2-B3	1023217.500	1893455.900	699.1	1023217.493	1893455.816	699.005	-0.007	-0.084	-0.095	
5	R5a-2-B4		1893455.500		1023224.008	1893455.494	699.061	0.008	-0.006	-0.039	
	R5a-2-B5		1893452.400					-0.071	0.020	-0.033	
	R5a-2-B6				1023204.697		700.577	-0.003	-0.033	-0.023	
	R5a-2-B7		1893451.100		1023215.581			-0.019	-0.075	-0.007	
	R5a-2-B8	1023191.300	1893446.200		1023191.303			0.003	0.010	-0.032	
5	R5a-2-B9	1023220.000	1893445.500	699.5	1023219.947	1893445.533	699.477	-0.053	0.033	-0.023	

Notes:

Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-3

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design			Actual			Data Comparison			Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	△ Northing	∆ Elevation	
5	R5a-3-12371b	1023188.300	1893432.600	704.1	1023188.317	1893432.662	704.093	0.017	0.062	-0.007	
5	R5a-3-B1	1023183.200	1893435.900	704.1	1023183.209	1893435.893	704.055	0.009	-0.007	-0.045	
5	R5a-3-B2	1023192.600	1893435.800	704.1	1023192.639	1893435.793	704.062	0.039	-0.007	-0.038	
5	R5a-3-B3	1023193.200	1893430.900	704.1	1023193.181	1893430.841	703.998	-0.019	-0.059	-0.102	
5	R5a-3-B4	1023184.200	1893428.600	704.1	1023184.149	1893428.528	704.077	-0.051	-0.072	-0.023	

Notes:

 $\overline{\Delta}$ Elevation < -0.16 ft Blue Δ Easting/Northing < or = 0.2 ft Green Δ Elevation -0.16 to 0.0 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment E Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-4

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design				Actual			ata Compar		Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-4-12352b	1023197.500	1893393.800	702	1023197.495	1893393.762	701.917	-0.005	-0.038	-0.083	
5	R5a-4-12375b	1023200.200	1893409.100	703.3	1023200.177	1893409.085	703.013	-0.023	-0.015	-0.287	
5	R5a-4-15131b	1023200.100	1893402.900	701.5	1023200.065	1893402.946	701.497	-0.035	0.046	-0.003	
5	R5a-4-B1	1023198.700	1893413.200	703.3	1023198.659	1893413.235	703.259	-0.041	0.035	-0.041	
5	R5a-4-B2	1023202.900	1893410.100	703.3	1023202.907	1893410.104	702.993	0.007	0.004	-0.307	
5	R5a-4-B3	1023193.700	1893409.500	703.3	1023193.740	1893409.447	703.286	0.040	-0.053	-0.014	
5	R5a-4-B4	1023193.800	1893401.900	701.5	1023193.723	1893401.936	701.468	-0.077	0.036	-0.032	
5	R5a-4-B5	1023203.300	1893400.300	701.5	1023203.320	1893400.340	701.429	0.020	0.040	-0.071	
5	R5a-4-B6	1023192.200	1893394.200	702	1023192.215	1893394.186	701.911	0.015	-0.014	-0.089	
5	R5a-4-B7	1023195.000	1893389.100	702	1023195.072	1893389.092	701.919	0.072	-0.008	-0.081	
5	R5a-4-B8	1023200.000	1893389.000	702	1023199.932	1893389.009	701.970	-0.068	0.009	-0.030	

Notes:

 Δ Elevation < -0.16 ft Blue Δ Easting/Northing < or = 0.2 ft Green Δ Elevation -0.16 to 0.0 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment E
Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-5

		Design				Actual		D	ata Compar	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation			∆ Elevation	
5	R5a-5-11778b	1023202.800	1893350.600	700.5	1023202.758	1893350.612	700.497	-0.042	0.012	-0.003	
5	R5a-5-11787b	1023205.200	1893367.000	700.5	1023205.175	1893366.974	700.288	-0.025	-0.026	-0.212	
5	R5a-5-11788b	1023203.300	1893367.300	700.3	1023203.267	1893367.281	700.285	-0.033	-0.019	-0.015	
5	R5a-5-11797b	1023205.300	1893383.500	700.7	1023205.200	1893383.383	700.484	-0.100	-0.117	-0.216	
5	R5a-5-11799b	1023201.600	1893376.500	701.3	1023201.576	1893376.479	701.212	-0.024	-0.021	-0.088	
5	R5a-5-11887b	1023200.400	1893336.700	700.5	1023200.430	1893336.714	700.497	0.030	0.014	-0.003	
5	R5a-5-11889b	1023202.800	1893318.500	700.6	1023202.818	1893318.542	700.555	0.018	0.042	-0.045	
5	R5a-5-11891b	1023201.900	1893309.200	700.1	1023201.964	1893309.209	700.051	0.064	0.009	-0.049	
5	R5a-5-11894b	1023198.200	1893303.300	699.6	1023198.166	1893303.321	699.576	-0.034	0.021	-0.024	
5	R5a-5-11896b	1023198.200	1893293.800	701.1	1023198.184	1893293.809	701.060	-0.016	0.009	-0.040	
5	R5a-5-11898b	1023196.800	1893286.400	699.6	1023196.826	1893286.340	699.538	0.026	-0.060	-0.062	
5	R5a-5-11904b	1023193.200	1893279.300	700.1	1023193.207	1893279.403	699.895	0.007	0.103	-0.205	
5	R5a-5-11905b	1023183.200	1893241.800	699.5	1023183.210	1893241.841	699.196	0.010	0.041	-0.304	
5	R5a-5-11906b	1023180.000	1893243.300	700.4	1023179.988	1893243.226	699.916	-0.012	-0.074	-0.484	
5	R5a-5-11909b	1023176.400	1893224.300	700	1023176.382	1893224.318	699.575	-0.018	0.018	-0.425	
5	R5a-5-11912b	1023178.200	1893206.800	698.9	1023178.171	1893206.776	698.660	-0.029	-0.024	-0.240	
	R5a-5-11914b				1023175.479		698.303	-0.021	0.059	-0.097	
5	R5a-5-11917b	1023172.100	1893178.600	699.6	1023172.107	1893178.683	699.527	0.007	0.083	-0.073	
5	R5a-5-11932b	1023188.600	1893263.700	701.3	1023188.604	1893263.649	700.997	0.004	-0.051	-0.303	
	R5a-5-11934b				1023185.831		700.471	-0.069	0.032	-0.129	
	R5a-5-12338b				1023192.870		700.897	-0.030	0.017	-0.303	
5	R5a-5-12339b	1023188.300	1893303.200	700.9	1023188.302	1893303.176	700.634	0.002	-0.024	-0.266	
	R5a-5-12341b				1023181.916		700.773	0.016	-0.043	-0.527	
	R5a-5-12342b				1023178.687		701.465	-0.013	0.011	-0.035	
	R5a-5-12343b				1023184.781		701.452	-0.019	0.050	-0.148	
	R5a-5-12344b				1023175.816		701.542	0.016	0.029	-0.058	
	R5a-5-12345b				1023177.076		700.171	-0.024	0.025	-0.029	
	R5a-5-12356b				1023193.934		703.950	0.034	0.050	-0.050	<u> </u>
	R5a-5-12357b				1023195.828		702.740	0.028	-0.002	-0.060	
	R5a-5-12360b						702.106	0.037	0.072	-0.394	
	R5a-5-14939b				1023161.493		698.196	-0.007	0.034	-0.504	<u> </u>
	R5a-5-14940b				1023155.864		700.212	-0.036	-0.056	-0.488	
	R5a-5-14941b				1023154.247		706.282	0.047	-0.009	-0.018	<u> </u>
	R5a-5-14967b				1023139.045		702.272	0.045	0.096	-0.328	
	R5a-5-14970b				1023138.585		701.372	-0.015	-0.129	-0.128	
_	R5a-5-14999b				1023167.453		698.987	-0.147	-0.054	-0.413	
5	R5a-5-15025b	1023172.600	1893242.100	699.6	1023172.589	1893242.054	699.237	-0.011	-0.046	-0.363	

Notes

 Δ Elevation < -0.25 ft Blue Δ Elevation -0.25 to 0.0 ft Green Δ Elevation -0.25 to 0.0 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment E
Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-5

		Design				Actual		D	ata Compar	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-5-15132b	1023195.800	1893374.800	702.3	1023195.783	1893374.819	702.288	-0.017	0.019	-0.012	
5	R5a-5-15135b	1023172.300	1893193.200	699.1	1023172.333	1893193.180	698.704	0.033	-0.020	-0.396	
5	R5a-5-B1	1023205.600	1893387.100	700.7	1023205.514	1893387.136	700.563	-0.086	0.036	-0.137	
5	R5a-5-B10	1023209.600	1893366.700	700.5	1023209.641	1893366.735	700.361	0.041	0.035	-0.139	
5	R5a-5-B11	1023208.600	1893362.400	700.5	1023208.651	1893362.464	700.264	0.051	0.064	-0.236	
5	R5a-5-B12	1023191.700	1893358.100	702.8	1023191.715	1893358.101	702.781	0.015	0.001	-0.019	
5	R5a-5-B13	1023199.300	1893350.400	700.5	1023199.300	1893350.398	700.375	0.000	-0.002	-0.125	
5	R5a-5-B14	1023204.200	1893350.300		1023204.257		700.437	0.057	-0.048	-0.063	
5	R5a-5-B15	1023196.900	1893340.200	700.5	1023196.881	1893340.176	700.490	-0.019	-0.024	-0.010	
5	R5a-5-B16	1023202.200	1893336.500	700.5	1023202.184	1893336.531	700.487	-0.016	0.031	-0.013	
5	R5a-5-B17	1023188.300	1893334.800	702.5	1023188.309	1893334.800	702.257	0.009	0.000	-0.243	
	R5a-5-B18	1023203.400	1893327.400	700.6	1023203.396	1893327.381	700.555	-0.004	-0.019	-0.045	
5	R5a-5-B19	1023188.900	1893326.300	701.2	1023188.917	1893326.309	700.981	0.017	0.009	-0.219	
	R5a-5-B2		1893382.600	700.7	1023208.986		700.659	-0.014	-0.020	-0.041	
5	R5a-5-B20		1893319.700	701.2	1023189.485	1893319.670	700.851	-0.015	-0.030	-0.349	
5	R5a-5-B21	1023203.600	1893318.300	700.6	1023203.612	1893318.304	700.568	0.012	0.004	-0.032	
	R5a-5-B22	1023195.600	1893309.300	700.1	1023195.673	1893309.358	700.059	0.073	0.058	-0.041	
5	R5a-5-B23	1023205.400	1893308.500	700.1	1023205.386		700.018	-0.014	0.026	-0.082	
5	R5a-5-B24	1023193.700	1893306.400	699.6	1023193.769	1893306.474	699.572	0.069	0.074	-0.028	
	R5a-5-B25		1893305.700	700.9	1023185.310		700.450	0.010	-0.017	-0.450	
	R5a-5-B26		1893302.700	699.6			699.451	-0.098	0.001	-0.149	
	R5a-5-B27	1023184.800			1023184.778		700.427	-0.022	-0.059	-0.473	
	R5a-5-B28	1023181.600			1023181.578		700.968	-0.022	-0.043	-0.332	
	R5a-5-B29		1893290.400		1023198.487		700.989	-0.013	0.050	-0.111	
	R5a-5-B3	1023202.100	1893380.300	701.3	1023202.034		701.133	-0.066	0.050	-0.167	
	R5a-5-B30	1023177.200		701.3	1023177.209		701.149	0.009	0.001	-0.151	
	R5a-5-B31	1023196.500		699.6	1023196.589		699.584	0.089	-0.054	-0.016	
	R5a-5-B32	1023175.000		701.5			701.492	-0.002	0.047	-0.008	
	R5a-5-B33	1023193.600		700.1	1023193.597		700.001	-0.003	-0.045	-0.099	
	R5a-5-B34	1023172.200		701.6	1023172.215		701.447	0.015	0.023	-0.153	
	R5a-5-B35	1023189.400			1023189.366		701.373	-0.034	-0.014	-0.227	
	R5a-5-B36		1893267.600		1023191.286		701.050	-0.014	-0.046	-0.250	
	R5a-5-B37	1023190.900		701.3			700.700	0.040	-0.046	-0.600	
	R5a-5-B38	1023173.700		700.2	1023173.656		700.019	-0.044	0.032	-0.181	
	R5a-5-B39		1893255.700	700.6	1023187.707		700.592	0.007	0.012	-0.008	
	R5a-5-B4		1893379.400	702.3	1023194.535		702.177	0.035	-0.035	-0.123	<u> </u>
5	R5a-5-B40	1023171.400	1893250.300	699.6	1023171.335	1893250.401	698.994	-0.065	0.101	-0.606	

Notes:

 $\begin{array}{ll} \Delta \ \, \mbox{Elevation} < \mbox{-0.25 ft Blue} & \Delta \ \, \mbox{Easting/Northing} < \mbox{or} = 0.2 \ \, \mbox{ft Green} \\ \Delta \ \, \mbox{Elevation} \ \, \mbox{-0.25 to} \ \, 0.0 \ \, \mbox{ft Green} & \Delta \ \, \mbox{Easting/Northing} > 0.2 \ \, \mbox{ft Blue} \\ \end{array}$

Attachment E
Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-5

		Design				Actual		D	ata Compar	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	△ Northing	∆ Elevation	
5	R5a-5-B41	1023186.300	1893248.200	699.5	1023186.303	1893248.136	699.412	0.003	-0.064	-0.088	
5	R5a-5-B42	1023168.200	1893242.500	699.6	1023168.264	1893242.487	699.566	0.064	-0.013	-0.034	
5	R5a-5-B43	1023188.200	1893240.800	699.5	1023188.191	1893240.832	699.394	-0.009	0.032	-0.106	
5	R5a-5-B44	1023182.500	1893237.400	699.5	1023182.503	1893237.429	698.994	0.003	0.029	-0.506	
5	R5a-5-B45	1023165.700	1893233.000	699.4	1023165.728	1893232.998	699.303	0.028	-0.002	-0.097	
5	R5a-5-B46	1023177.200	1893224.100	700	1023177.181	1893224.082	699.486	-0.019	-0.018	-0.514	
5	R5a-5-B47	1023163.600	1893223.500	699.4	1023163.576	1893223.525	699.296	-0.024	0.025	-0.104	
5	R5a-5-B48	1023178.700	1893219.800	700	1023178.691	1893219.861	699.477	-0.009	0.061	-0.523	
5	R5a-5-B49	1023179.600	1893211.000	698.9	1023179.612	1893210.947	698.632	0.012	-0.053	-0.268	
5	R5a-5-B5	1023203.800	1893376.000	701.3	1023203.834	1893375.945	701.152	0.034	-0.055	-0.148	
5	R5a-5-B50	1023160.800	1893210.900	698.7	1023160.702	1893210.945	698.412	-0.098	0.045	-0.288	
5	R5a-5-B51	1023157.400	1893207.900	698.7	1023157.411	1893207.838	698.675	0.011	-0.062	-0.025	
5	R5a-5-B52	1023182.400	1893206.200	698.9	1023182.347	1893206.211	698.815	-0.053	0.011	-0.085	
5	R5a-5-B53	1023137.300	1893202.100	702.6	1023137.324	1893202.119	702.058	0.024	0.019	-0.542	
5	R5a-5-B54	1023154.600	1893201.300	700.7	1023154.648	1893201.338	700.680	0.048	0.038	-0.020	
5	R5a-5-B55	1023149.500	1893199.100	700.7	1023149.535	1893199.120	700.437	0.035	0.020	-0.263	
5	R5a-5-B56	1023135.300	1893198.000	702.6	1023135.262	1893197.949	702.413	-0.038	-0.051	-0.187	
5	R5a-5-B57	1023179.400	1893192.500	698.4	1023179.446	1893192.491	698.127	0.046	-0.009	-0.273	
5	R5a-5-B58	1023134.800	1893186.500	701.5	1023134.957	1893186.501	701.249	0.157	0.001	-0.251	
5	R5a-5-B59	1023142.600	1893184.000	701.5	1023142.601	1893183.907	701.159	0.001	-0.093	-0.341	
5	R5a-5-B6	1023193.000	1893374.300	702.3	1023193.023	1893374.375	702.106	0.023	0.075	-0.194	
5	R5a-5-B60	1023150.400	1893179.300	706.3	1023150.446	1893179.274	706.299	0.046	-0.026	-0.001	
5	R5a-5-B61	1023177.000	1893178.600	699.6	1023176.977	1893178.643	699.493	-0.023	0.043	-0.107	
5	R5a-5-B62	1023172.000	1893174.500	699.6	1023172.008		699.155	0.008	0.028	-0.445	Pt. surveyed as B175 in Area 1 of STP
	R5a-5-B63	1023151.400		706.3	1023151.408		706.281	0.008	0.014	-0.019	
	R5a-5-B7	1023204.600		700.3	1023204.604		700.237	0.004	0.024	-0.063	
	R5a-5-B8		1893370.900	700.5	1023208.169		700.333	-0.031	-0.011	-0.167	
5	R5a-5-B9	1023190.400	1893367.600	704	1023190.474	1893367.594	703.990	0.074	-0.006	-0.010	

Notes:

 Δ Elevation < -0.25 ft Blue Δ Easting/Northing < or = 0.2 ft Green Δ Elevation -0.25 to 0.0 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment E
Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-6

		Design				Actual		D	ata Compar	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting		Elevation			∆ Elevation	
5	R5a-6-11938b	1023167.500	1893157.600	699.6	1023167.568	1893157.471	699.226	0.068	-0.129	-0.374	
	R5a-6-11940b				1023167.047		700.455	0.047	0.031	-0.345	
5	R5a-6-11958b	1023158.400	1893132.400	700.5	1023158.452	1893132.396	700.428	0.052	-0.004	-0.072	
5	R5a-6-11961b	1023162.100	1893115.800	700	1023162.112	1893115.864	699.732	0.012	0.064	-0.268	
5	R5a-6-11962b	1023159.600	1893115.400	700.2	1023159.624	1893115.383	700.125	0.024	-0.017	-0.075	
5	R5a-6-11964b	1023161.400	1893100.400		1023161.452		699.788	0.052	0.053	-0.012	
5	R5a-6-11965b	1023152.600	1893101.500	699.9	1023152.525	1893101.496	699.790	-0.075	-0.004	-0.110	
5	R5a-6-11966b	1023150.600	1893102.100	700.1	1023150.656	1893102.063	700.076	0.056	-0.037	-0.024	
	R5a-6-11967b				1023160.032	1893090.895	699.453	0.032	-0.005	-0.147	
5	R5a-6-11968b	1023151.000	1893095.500	700.2	1023150.991	1893095.514	699.785	-0.009	0.014	-0.415	
5	R5a-6-11973b	1023168.000	1893089.800	699.6	1023168.087	1893089.880	699.377	0.087	0.080	-0.223	
5	R5a-6-14953b	1023141.500	1893131.300		1023141.513		699.795	0.013	0.006	-0.805	
5	R5a-6-14954b				1023142.173	1893114.603	701.757	-0.027	0.003	-0.743	
5	R5a-6-14977b	1023146.800	1893141.200	700.2	1023146.804	1893141.290	699.774	0.004	0.090	-0.426	
5	R5a-6-14983b	1023137.100	1893108.600	703.2	1023137.142	1893108.672	703.045	0.042	0.072	-0.155	
5	R5a-6-15991b	1023149.800	1893157.500		1023149.794		700.434	-0.006	-0.156	-0.066	Pt. Surveyed as 15991b in Area 4 of STP
5	R5a-6-15992b	1023151.000	1893148.500	699.3	1023150.997	1893148.479	699.219	-0.003	-0.021	-0.081	•
5	R5a-6-B1	1023152.400	1893162.900	700.5	1023152.292	1893162.937	699.298	-0.108	0.037	-1.202	Pt. Surveyed as B204 in Area 1 of STP
5	R5a-6-B10	1023166.100	1893115.600	700	1023166.137	1893115.550	699.621	0.037	-0.050	-0.379	
5	R5a-6-B11	1023161.000	1893111.400	700.2	1023161.087	1893111.364	699.642	0.087	-0.036	-0.558	
5	R5a-6-B12	1023133.400	1893109.700	703.2	1023133.356	1893109.721	703.076	-0.044	0.021	-0.124	
5	R5a-6-B13	1023135.400	1893105.000	703.2	1023135.378	1893105.072	703.152	-0.022	0.072	-0.048	
5	R5a-6-B14	1023157.500	1893104.500	699.8	1023157.568	1893104.511	699.666	0.068	0.011	-0.134	
5	R5a-6-B15	1023161.900	1893103.900	699.8	1023161.938	1893103.853	699.665	0.038	-0.047	-0.135	
5	R5a-6-B16	1023142.300	1893103.300	703.2	1023142.237	1893103.343	702.532	-0.063	0.043	-0.668	
5	R5a-6-B17	1023150.300	1893095.500	700.2	1023150.231	1893095.485	699.746	-0.069	-0.015	-0.454	
5	R5a-6-B18	1023169.000	1893094.700	699.6	1023169.109	1893094.593	699.519	0.109	-0.107	-0.081	
	R5a-6-B19	1023173.400			1023173.334		699.533	-0.066	0.083	-0.067	
	R5a-6-B2	1023170.900			1023170.909		699.012	0.009	-0.008		Pt. Surveyed as B208 in Area 1 of STP
	R5a-6-B20	1023149.900			1023149.893		699.776	-0.007	0.047	-0.424	
	R5a-6-B21	1023172.300			1023172.317	1893088.749	699.162	0.017	-0.051	-0.438	
	R5a-6-B22	1023158.900			1023158.868	1893087.706	699.543	-0.032	0.006	-0.057	
5	R5a-6-B23	1023167.200	1893086.500	699.6	1023167.221	1893086.509	699.056	0.021	0.009	-0.544	
	R5a-6-B3	1023171.500	1893156.300			1893156.312	699.555	-0.029	0.012	-0.045	
5	R5a-6-B4	1023168.300	1893148.900	700.8	1023168.312	1893148.920	700.622	0.012	0.020	-0.178	
5	R5a-6-B5	1023165.800	1893140.900	700.8	1023165.745	1893140.888	699.904	-0.055	-0.012	-0.896	
5	R5a-6-B6	1023137.400	1893128.200	700.6	1023137.367	1893128.222	699.720	-0.033	0.022	-0.880	

Notes:

 Δ Elevation < -0.25 ft Blue Δ Elevation -0.25 to 0.0 ft Green Δ Elevation -0.25 to 0.0 ft Green Δ Easting/Northing > 0.2 ft Blue

Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-6

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design				Actual		D	ata Compar	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	△ Northing	∆ Elevation	
5	R5a-6-B7	1023161.500	1893127.800	700.5	1023161.473	1893127.806	700.389	-0.027	0.006	-0.111	
5	R5a-6-B8	1023163.400	1893119.500	700	1023163.329	1893119.504	699.884	-0.071	0.004	-0.116	
5	R5a-6-B9	1023137.600	1893115.800	702.5	1023137.519	1893115.771	701.765	-0.081	-0.029	-0.735	

Notes:

 $\begin{array}{ll} \Delta \ \, \text{Elevation} < \text{-0.25 ft Blue} & \Delta \ \, \text{Easting/Northing} < \text{or} = 0.2 \ \text{ft Green} \\ \Delta \ \, \text{Elevation} \ \, \text{-0.25 to} \ \, 0.0 \ \text{ft Green} & \Delta \ \, \text{Easting/Northing} > 0.2 \ \text{ft Blue} \\ \end{array}$

Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-7

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design			Actual			Data Comparison			Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	△ Northing	∆ Elevation	
5	R5a-7-11980b	1023156.300	1893069.300	698.8	1023156.331	1893069.370	698.393	0.031	0.070	-0.407	
5	R5a-7-B1	1023152.200	1893074.200	698.8	1023152.171	1893074.234	698.621	-0.029	0.034	-0.179	
5	R5a-7-B2	1023160.800	1893072.900	698.8	1023160.820	1893072.836	698.615	0.020	-0.064	-0.185	
5	R5a-7-B3	1023160.100	1893068.200	698.8	1023160.086	1893068.186	698.622	-0.014	-0.014	-0.178	
5	R5a-7-B4	1023151.400	1893065.500	698.8	1023151.422	1893065.484	698.681	0.022	-0.016	-0.119	
5	R5a-7-B5	1023155.700	1893064.900	698.8	1023155.743	1893064.950	698.756	0.043	0.050	-0.044	

Notes:

 Δ Elevation < -0.25 ft Blue

 Δ Easting/Northing < or = 0.2 ft Green

 \triangle Elevation -0.25 to 0.0 ft Green \triangle Easting/Northing > 0.2 ft Blue

Attachment E
Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-8

		Design				Actual		D	ata Compar	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-8-11978b	1023144.200	1893079.900	701.3	1023144.285	1893079.939	701.275	0.085	0.039	-0.025	
5	R5a-8-11982b	1023143.900	1893071.300	702	1023143.868	1893071.243	701.870	-0.032	-0.057	-0.130	
5	R5a-8-11984b	1023144.100	1893055.800	701.4	1023144.039	1893055.814	701.351	-0.061	0.014	-0.049	
5	R5a-8-12007b	1023138.000	1893043.700	700.5	1023138.032	1893043.680	700.448	0.032	-0.020	-0.052	
5	R5a-8-15041b	1023136.500	1893082.400	702.1	1023136.420	1893082.438	702.052	-0.080	0.038	-0.048	
	R5a-8-B1	1023135.100	1893091.900	702.1	1023135.121	1893091.906	702.001	0.021	0.006	-0.099	
5	R5a-8-B10	1023138.300	1893065.600	702	1023138.291	1893065.635	701.976	-0.009	0.035	-0.024	
5	R5a-8-B11		1893063.300		1023145.729	1893063.305	701.288	-0.071	0.005	-0.112	
5	R5a-8-B12	1023138.400	1893057.800	701.4	1023138.385	1893057.798	701.254	-0.015	-0.002	-0.146	
5	R5a-8-B13	1023135.400	1893051.800	700.5	1023135.420	1893051.827	700.483	0.020	0.027	-0.017	
5	R5a-8-B14	1023143.800	1893050.900	701.4	1023143.784	1893050.925	701.319	-0.016	0.025	-0.081	
5	R5a-8-B15	1023129.600	1893045.800	700.5	1023129.474	1893045.769	700.472	-0.126	-0.031	-0.028	
5	R5a-8-B16		1893044.900		1023140.711	1893044.933	700.468	0.011	0.033	-0.032	
5	R5a-8-B17	1023140.700	1893043.000	700.5	1023140.683	1893043.168	700.256	-0.017	0.168	-0.244	
	R5a-8-B18		1893042.400		1023127.910	1893042.471	700.239	0.010	0.071	-0.261	
	R5a-8-B2		1893091.300		1023139.152	1893091.384	702.098	0.052	0.084	-0.002	
	R5a-8-B3		1893085.400		1023141.583			-0.017	0.047	-0.149	
	R5a-8-B4		1893084.100		1023145.452	1893084.127		-0.048	0.027	-0.013	
5	R5a-8-B5	1023132.600	1893082.900	702.1	1023132.512	1893082.849	702.053	-0.088	-0.051	-0.047	
5	R5a-8-B6	1023146.200	1893079.500		1023146.259			0.059	0.010	-0.035	
5	R5a-8-B7	1023132.700	1893078.700	702.1	1023132.660	1893078.602	702.079	-0.040	-0.098	-0.021	
5	R5a-8-B8	1023136.400	1893073.100	702	1023136.373	1893073.162	701.994	-0.027	0.062	-0.006	
5	R5a-8-B9	1023145.900	1893070.900	702	1023145.932	1893070.939	701.200	0.032	0.039	-0.800	

Notes

 $\begin{array}{ll} \Delta \ \, \mbox{Elevation} < \mbox{-0.16 ft Blue} & \Delta \ \, \mbox{Easting/Northing} < \mbox{or} = 0.2 \ \mbox{ft Green} \\ \Delta \ \, \mbox{Elevation} - 0.16 \ \mbox{to} \ 0.0 \ \mbox{ft Green} & \Delta \ \, \mbox{Easting/Northing} > 0.2 \ \mbox{ft Blue} \\ \end{array}$

Attachment E
Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-9

		Design				Actual		D	ata Compar	rison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-9-12005b	1023154.000	1893044.100	699.2	1023153.899	1893044.051	699.120	-0.101	-0.049	-0.080	
5	R5a-9-12009b	1023153.300	1893034.300	699.5	1023153.273	1893034.390	699.087	-0.027	0.090	-0.413	
5	R5a-9-12010b	1023152.400	1893019.600	699.6	1023152.319	1893019.699	699.297	-0.081	0.099	-0.303	
5	R5a-9-12011b	1023144.600	1893022.300	699.5	1023144.573	1893022.310	699.316	-0.027	0.010	-0.184	
5	R5a-9-12012b	1023142.000	1893024.000	700	1023142.147	1893024.015	699.405	0.147	0.015	-0.595	
5	R5a-9-12030b	1023129.400	1893026.500	701.5	1023129.420	1893026.438	701.446	0.020	-0.062	-0.054	
5	R5a-9-12032b	1023142.800	1893014.000	699.5	1023142.778	1893014.020	699.290	-0.022	0.020	-0.210	
5	R5a-9-12033b	1023138.300	1893014.800	701.3	1023138.323	1893014.870	700.942	0.023	0.070	-0.358	
5	R5a-9-12038b	1023131.000	1892992.900	701.4	1023131.097	1892992.963	701.039	0.097	0.063	-0.361	
5	R5a-9-12039b	1023130.500	1893017.100	702.4	1023130.556	1893017.184	702.227	0.056	0.084	-0.173	
5	R5a-9-12040b	1023123.500	1893018.600	702.6	1023123.490	1893018.652	702.315	-0.010	0.052	-0.285	
5	R5a-9-12041b	1023128.000	1893010.600	702.6	1023127.986	1893010.506	702.064	-0.014	-0.094	-0.536	
5	R5a-9-12042b	1023112.400	1893014.100	702.5	1023112.404	1893014.235	702.325	0.004	0.135	-0.175	
5	R5a-9-12044b	1023132.700	1893001.400			1893001.342	702.827	0.091	-0.058	-0.073	
5	R5a-9-12045b	1023126.700	1893004.600		1023126.704		702.536	0.004	0.043	-0.164	
5	R5a-9-12046b	1023118.500	1893005.200	703.1	1023118.502	1893005.089	703.008	0.002	-0.111	-0.092	
	R5a-9-12082b				1023127.477		701.078		-0.117	-0.722	
5	R5a-9-12089b	1023124.100	1892966.600	702.4	1023124.121	1892966.550	701.345	0.021	-0.050	-1.055	
5	R5a-9-12091b	1023124.200	1892959.800	701.7	1023124.248	1892959.740	701.554	0.048	-0.060	-0.146	
	R5a-9-12095b				1023116.346		702.409	-0.054	-0.063	-0.391	
	R5a-9-12119b				1023117.479		702.446	-0.021	-0.043	-0.354	
5	R5a-9-15031b	1023120.400	1893028.500	702.3	1023120.389	1893028.510	701.831	-0.011	0.010	-0.469	
	R5a-9-B1	1023154.400			1023154.466				-0.020	-0.054	
	R5a-9-B10	1023136.800			1023136.824				-0.020	-0.094	
	R5a-9-B11	1023146.400			1023146.439		699.367	0.039	-0.003	-0.133	
	R5a-9-B12	1023118.100			1023118.079		702.048	-0.021	-0.080	-0.252	
	R5a-9-B13	1023120.000			1023120.006		702.133	0.006	0.025	-0.467	
	R5a-9-B14	1023156.400			1023156.462			0.062	0.000	-0.097	
	R5a-9-B15	1023114.500			1023114.448		702.067	-0.052	-0.115	-0.433	
	R5a-9-B16	1023122.700			1023122.755		702.474	0.055	0.031	-0.126	
	R5a-9-B17	1023125.800			1023125.862		702.311	0.062	0.082	-0.289	
	R5a-9-B18	1023117.100			1023116.973			-0.127	-0.141	-0.079	
	R5a-9-B19	1023147.200			1023147.226		699.275	0.026	-0.035	-0.225	
	R5a-9-B2	1023158.500			1023158.527		699.186		-0.089	-0.014	
	R5a-9-B20	1023137.100			1023137.090			-0.010	0.040	-0.518	
	R5a-9-B21	1023110.300			1023110.273			-0.027	-0.065	-0.276	
5	R5a-9-B22	1023145.100	1893010.100	699.5	1023145.169	1893010.043	699.175	0.069	-0.057	-0.325	

Notes:

Attachment E Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-9

		Design				Actual		D	ata Compar	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation			∆ Elevation	
5	R5a-9-B23	1023131.900	1893008.800	702.6	1023131.879	1893008.729	702.412	-0.021	-0.071	-0.188	
5	R5a-9-B24	1023120.200	1893008.600	703.1	1023120.251	1893008.672	702.823	0.051	0.072	-0.277	
5	R5a-9-B25	1023124.300	1893008.300	702.7	1023124.334	1893008.179	702.687	0.034	-0.121	-0.013	
5	R5a-9-B26	1023113.300	1893006.300	703.1	1023113.304	1893006.391	703.094	0.004	0.091	-0.006	
5	R5a-9-B27	1023118.400	1893001.700	703.1	1023118.406	1893001.743	702.807	0.006	0.043	-0.293	
5	R5a-9-B28	1023134.600	1893000.900	702.9	1023134.596	1893000.854	702.773	-0.004	-0.046	-0.127	
5	R5a-9-B29	1023125.100	1893000.100	702.7	1023125.082	1893000.056	702.432	-0.018	-0.044	-0.268	
5	R5a-9-B3	1023148.700	1893045.100	699.2	1023148.756	1893045.184	699.150	0.056	0.084	-0.050	
5	R5a-9-B30	1023133.700	1892996.600	701.4	1023133.659	1892996.572	701.298	-0.041	-0.028	-0.102	
5	R5a-9-B31	1023127.300	1892994.200	701.4	1023127.344	1892994.149	701.217	0.044	-0.051	-0.183	
5	R5a-9-B32	1023132.900	1892992.100	701.4	1023132.900	1892991.981	700.854	0.000	-0.119	-0.546	
5	R5a-9-B33	1023122.800	1892987.200	701.8	1023122.804	1892987.235	701.240	0.004	0.035	-0.560	
5	R5a-9-B34	1023130.000	1892984.400	701.8	1023129.923	1892984.342	700.562	-0.077	-0.058	-1.238	
5	R5a-9-B35	1023114.200	1892981.400	702.8	1023114.185	1892981.371	702.505	-0.015	-0.029	-0.295	
5	R5a-9-B36	1023127.100	1892980.400	701.8	1023127.054	1892980.332	701.185	-0.046	-0.068	-0.615	
5	R5a-9-B37	1023122.100	1892977.800	702.8	1023122.091	1892977.744	702.152	-0.009	-0.056	-0.648	
5	R5a-9-B38	1023112.400	1892973.800	702.8	1023112.524	1892973.783	702.732	0.124	-0.017	-0.068	
5	R5a-9-B39	1023112.200	1892968.700	702.8	1023112.270	1892968.702	702.576	0.070	0.002	-0.224	
5	R5a-9-B4	1023158.500	1893043.500	699.2	1023158.514	1893043.431	698.979	0.014	-0.069	-0.221	
5	R5a-9-B40	1023126.600	1892966.400	702.4	1023126.578	1892966.279	701.207	-0.022	-0.121	-1.193	
5	R5a-9-B41	1023119.200	1892964.900	702.4	1023119.227	1892964.933	701.977	0.027	0.033	-0.423	
5	R5a-9-B42	1023126.000	1892959.200	701.7	1023125.874	1892959.171	701.243	-0.126	-0.029	-0.457	
5	R5a-9-B43	1023118.800	1892957.300	701.7	1023118.888	1892957.335	701.647	0.088	0.035	-0.053	
5	R5a-9-B44	1023123.700	1892955.600	701.7	1023123.747	1892955.561	701.656	0.047	-0.039	-0.044	
5	R5a-9-B5	1023148.400	1893035.500	699.5	1023148.371	1893035.580	698.846	-0.029	0.080	-0.654	
5	R5a-9-B6	1023157.400	1893033.800	699.5	1023157.412	1893033.765	699.190	0.012	-0.035	-0.310	
5	R5a-9-B7	1023137.100	1893032.800	701.5	1023137.109	1893032.866	701.297	0.009	0.066	-0.203	Pt. Surveyed as B319 in Area 5 of STP
5	R5a-9-B8	1023127.200	1893032.400	701.5	1023127.111	1893032.428	701.426	-0.089	0.028	-0.074	Pt. Surveyed as B322 in Area 5 of STP
5	R5a-9-B9	1023120.100	1893032.100	702.3	1023119.999	1893032.062	702.145	-0.101	-0.038	-0.155	Pt. Surveyed as B324 in Area 5 of STP

Notes:

 Δ Elevation < -0.25 ft Blue Δ Easting/Northing < or = 0.2 ft Green Δ Elevation -0.25 to 0.0 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment E Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-10

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design				Actual		Da	ata Comparis	son	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-10-12130	1023111.500	1892892.200	701.4	1023111.450	1892892.240	701.371	-0.050	0.040	-0.029	
5	R5a-10-12131	1023099.600	1892898.900	703.1	1023099.575	1892898.982	703.085	-0.025	0.082	-0.015	
5	R5a-10-B1	1023101.500	1892902.800	703.1	1023101.495	1892902.731	703.088	-0.005	-0.069	-0.012	
5	R5a-10-B2	1023096.300	1892900.800	703.1	1023096.225	1892900.774	703.082	-0.075	-0.026	-0.018	
5	R5a-10-B3	1023106.900	1892899.100	703.1	1023106.929	1892899.141	702.858	0.029	0.041	-0.242	
5	R5a-10-B4	1023095.700	1892897.300	703.1	1023095.784	1892897.343	702.990	0.084	0.043	-0.110	
5	R5a-10-B5	1023114.000	1892895.000	701.4	1023114.114	1892895.034	701.258	0.114	0.034	-0.142	
5	R5a-10-B6	1023104.100	1892893.800	703.1	1023104.004	1892893.834	702.943	-0.096	0.034	-0.157	
5	R5a-10-B7	1023111.800	1892890.200	701.4	1023111.900	1892890.129	701.321	0.100	-0.071	-0.079	·

Notes:

 Δ Elevation < -0.16 ft Blue Δ Easting/Northing < or = 0.2 ft Green Δ Elevation -0.16 to 0.0 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment E
Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-11

		Design				Actual		D	ata Compari	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-11-12166	1022918.400	1892751.200	701.9	1022918.472	1892751.151	700.682	0.072	-0.049	-1.218	Excavated deeper due to backhoe ruts
5	R5a-11-12169	1022920.100	1892739.800	701.5	1022920.005	1892739.871	699.931	-0.095	0.071	-1.569	Excavated deeper due to backhoe ruts
5	R5a-11-12170	1022910.000	1892746.000	702.5	1022910.021	1892745.995	701.303	0.021	-0.005	-1.197	Excavated deeper due to backhoe ruts
5	R5a-11-12175	1022911.500	1892726.400	701.1	1022911.409	1892726.371	700.529	-0.091	-0.029	-0.571	Excavated deeper due to backhoe ruts
5	R5a-11-12176	1022904.000	1892730.400		1022904.025			0.025	0.074	-0.733	Excavated deeper due to backhoe ruts
5	R5a-11-12177	1022902.800	1892712.800	700.9	1022902.806	1892712.900	700.753	0.006	0.100	-0.147	
5	R5a-11-12206	1022914.300	1892705.400	701.8	1022914.249	1892705.375	701.685	-0.051	-0.025	-0.115	
5	R5a-11-12207	1022892.300	1892718.400	700.8	1022892.308	1892718.439	700.761	0.008	0.039	-0.039	
5	R5a-11-12209	1022915.400	1892693.800	701.7	1022915.371	1892693.828	701.671	-0.029	0.028	-0.029	
5	R5a-11-12211	1022909.700	1892689.000	701.7	1022909.698	1892689.026	701.443	-0.002	0.026	-0.257	
5	R5a-11-12212	1022904.100	1892692.200	701	1022904.086	1892692.144	700.918	-0.014	-0.056	-0.082	
5	R5a-11-12213	1022892.900	1892699.900	700.8	1022892.903	1892699.768	700.675	0.003	-0.132	-0.125	
5	R5a-11-12214	1022885.800	1892705.400	701	1022885.818	1892705.415	700.993	0.018	0.015	-0.007	
5	R5a-11-12216	1022897.100	1892678.600	700.3	1022897.083	1892678.676	700.235	-0.017	0.076	-0.065	
5	R5a-11-12217	1022883.400	1892688.100	700.5	1022883.489	1892687.963	700.427	0.089	-0.137	-0.073	
5	R5a-11-12218	1022875.000	1892673.400	700.7	1022874.856	1892673.458	700.396	-0.144	0.058	-0.304	
5	R5a-11-12220	1022902.000	1892672.600	701.4	1022902.025	1892672.622	701.298	0.025	0.022	-0.102	
5	R5a-11-12226	1022894.700	1892660.200	701.4	1022894.636	1892660.098	701.354	-0.064	-0.102	-0.046	
5	R5a-11-12227	1022887.900	1892664.800	700.7	1022887.946	1892664.874	700.513	0.046	0.074	-0.187	
5	R5a-11-12231	1022880.100	1892650.500	700.8	1022880.070	1892650.494	700.663	-0.030	-0.006	-0.137	
5	R5a-11-12232	1022865.400	1892661.300	701	1022865.500	1892661.350	700.854	0.100	0.050	-0.146	
5	R5a-11-12233	1022871.600	1892635.600		1022871.579			-0.021	-0.027	-0.137	
5	R5a-11-12255	1022878.300	1892631.400	701.9	1022878.308	1892631.540	701.847	0.008	0.140	-0.053	
5	R5a-11-12256	1022864.400	1892640.100	701.5	1022864.436	1892640.092	701.359	0.036	-0.008	-0.141	
5	R5a-11-12258	1022862.100	1892620.300	701.2	1022862.038	1892620.277	701.176	-0.062	-0.023	-0.024	
5	R5a-11-12261	1022853.200	1892606.100	701.3	1022853.179	1892606.201	701.263	-0.021	0.101	-0.037	
5	R5a-11-12263	1022855.500	1892623.600	701.5	1022855.387	1892623.518	701.372	-0.113	-0.082	-0.128	
5	R5a-11-12265	1022844.600	1892609.600	701.8	1022844.684	1892609.666	701.766	0.084	0.066	-0.034	
5	R5a-11-12268	1022844.500	1892591.700	701.1	1022844.453	1892591.738	701.019	-0.047	0.038	-0.081	
5	R5a-11-12271	1022836.600	1892594.300	701.1	1022836.543	1892594.336	701.080	-0.057	0.036	-0.020	
5	R5a-11-12273	1022831.700	1892587.200	701.6	1022831.647	1892587.147	701.552	-0.053	-0.053	-0.048	
5	R5a-11-12278	1022819.300	1892583.500	702.6	1022819.289	1892583.516	702.456	-0.011	0.016	-0.144	
5	R5a-11-15046	1022912.000	1892756.400	702.2	1022912.014	1892756.337	702.082	0.014	-0.063	-0.118	
5	R5a-11-15048	1022897.800	1892735.100	700.4	1022897.879	1892735.131	700.364	0.079	0.031	-0.036	
5	R5a-11-15052	1022885.700	1892746.800	702.7	1022885.635	1892746.692	702.692	-0.065	-0.108	-0.008	
5	R5a-11-15053	1022873.600	1892735.000	703	1022873.601	1892734.985	702.857	0.001	-0.015	-0.143	
5	R5a-11-15054	1022879.400	1892710.600	702.5	1022879.443	1892710.525	702.361	0.043	-0.075	-0.139	

Notes:

 Δ Elevation < -0.16 ft Blue Δ Easting/Northing < or = 0.2 ft Green Δ Elevation -0.16 to 0.0 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment E
Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-11

		Design				Actual		D	ata Compari	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-11-15055	1022876.800	1892691.700	701.7	1022876.752	1892691.776	701.559	-0.048	0.076	-0.141	
5	R5a-11-15066	1022870.200	1892727.600	702.8	1022870.320	1892727.622	702.666	0.120	0.022	-0.134	
5	R5a-11-15138	1022903.600	1892750.600	701.5	1022903.607	1892750.608	701.487	0.007	0.008	-0.013	
5	R5a-11-15140	1022888.300	1892723.900	701.9	1022888.350	1892723.921	701.895	0.050	0.021	-0.005	
5	R5a-11-B1	1022904.800	1892762.900	702.2	1022904.734	1892762.902	702.172	-0.066	0.002	-0.028	
5	R5a-11-B10	1022866.500	1892731.800	702.8	1022866.429	1892731.872	702.796	-0.071	0.072	-0.004	
5	R5a-11-B11	1022919.400	1892730.800	701.1	1022919.520	1892730.891	700.031	0.120	0.091	-1.069	Excavated deeper due to backhoe ruts
5	R5a-11-B12	1022919.700	1892725.900		1022919.635			-0.065	-0.115	-0.800	Excavated deeper due to backhoe ruts
5	R5a-11-B13	1022868.300	1892724.700	702.8	1022868.257	1892724.692	702.747	-0.043	-0.008	-0.053	
5	R5a-11-B14	1022874.800	1892719.100	702.5	1022874.726	1892719.137	702.464	-0.074	0.037	-0.036	
5	R5a-11-B15	1022912.700	1892715.700	700.9	1022912.741		700.855	0.041	0.005	-0.045	
	R5a-11-B16	1022922.300		701.8	1022922.285		701.701	-0.015	0.022	-0.099	
				702.5	1022870.932	1892707.441	702.392	0.032	-0.059	-0.108	
					1022917.416		701.515	-0.084	0.020	-0.285	
		1022869.600			1022869.637		701.680	0.037	-0.063	-0.020	
			1892758.700		1022915.066		702.198	0.066	-0.020	-0.002	
					1022918.727		701.634	0.027	0.011	-0.066	
		1022878.000		701.7	1022878.160			0.160	-0.031	-0.095	
		1022913.500		701.7	1022913.538		701.346	0.038	0.064	-0.354	
			1892677.700		1022909.638			-0.062	0.029	-0.027	
		1022872.000		700.7	1022871.948			-0.052	-0.030	-0.077	
		1022906.900			1022906.920		701.354	0.020	0.001	-0.046	
					1022865.476			-0.024	0.037	-0.166	
		1022901.400			1022901.458			0.058	-0.188	-0.013	
					1022863.023		700.851	-0.177	0.012	-0.149	
				701.4		1892658.185		0.021	-0.015	-0.085	
	R5a-11-B3	1022898.300		701.5	1022898.203		701.426	-0.097	0.022	-0.074	
				701.4	1022892.442		701.391	-0.058	0.107	-0.009	
	R5a-11-B31			700.8	1022885.126			-0.074	0.046	-0.040	
		1022862.900		701.5	1022862.777	1892647.512	701.481	-0.123	-0.088	-0.019	
					1022881.342		700.769	0.042	0.051	-0.031	
		1022860.700			1022860.644			-0.056	0.005	-0.141	
	R5a-11-B35	1022877.000		700.9	1022876.906			-0.094	-0.015	-0.118	
	R5a-11-B36			701.5		1892633.986		0.020	-0.014	-0.158	
			1892631.900		1022883.583		701.876	-0.017	-0.053	-0.024	
		1022881.500			1022881.449		701.849	-0.051	-0.049	-0.051	
5	R5a-11-B39	1022851.300	1892624.800	701.5	1022851.198	1892624.788	701.490	-0.102	-0.012	-0.010	

Notes:

 Δ Elevation < -0.16 ft Blue Δ Easting/Northing < or = 0.2 ft Green Δ Elevation -0.16 to 0.0 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment E
Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-11

		Design				Actual		D	ata Compari	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-11-B4	1022922.000	1892753.600	701.9	1022921.897	1892753.618	700.617	-0.103	0.018	-1.283	Excavated deeper due to backhoe ruts
5	R5a-11-B40	1022874.000	1892623.800	701.9	1022873.931	1892623.777	701.824	-0.069	-0.023	-0.076	
5	R5a-11-B41	1022865.900	1892618.200	701.2	1022865.948	1892618.148	701.154	0.048	-0.052	-0.046	
5	R5a-11-B42	1022845.800	1892617.800	701.8	1022845.786	1892617.785	701.742	-0.014	-0.015	-0.058	
5	R5a-11-B43	1022841.300	1892611.600	701.8	1022841.275	1892611.609	701.672	-0.025	0.009	-0.128	
5	R5a-11-B44	1022861.600	1892611.000	701.2	1022861.554	1892610.956	701.180	-0.046	-0.044	-0.020	
5	R5a-11-B45	1022837.300	1892604.000	701.8	1022837.222	1892604.019	701.678	-0.078	0.019	-0.122	
5	R5a-11-B46	1022857.000	1892604.000	701.3	1022856.914	1892603.960	701.221	-0.086	-0.040	-0.079	
5	R5a-11-B47	1022852.200	1892596.700	701.1	1022852.222	1892596.675	701.087	0.022	-0.025	-0.013	
5	R5a-11-B48	1022832.700	1892595.800	701.1	1022832.630	1892595.771	701.092	-0.070	-0.029	-0.008	
5	R5a-11-B49	1022828.100	1892589.500	701.6	1022828.118	1892589.556	701.530	0.018	0.056	-0.070	
5	R5a-11-B5	1022896.900	1892752.900	701.5	1022896.949	1892752.792	701.485	0.049	-0.108	-0.015	
5	R5a-11-B50	1022847.800	1892589.500	701.1	1022847.663	1892589.505	700.977	-0.137	0.005	-0.123	
5	R5a-11-B51	1022818.200	1892588.900	702.6	1022818.092	1892588.885	702.598	-0.108	-0.015	-0.002	
5	R5a-11-B52	1022821.900	1892587.600	702.6	1022821.937	1892587.610	702.460	0.037	0.010	-0.140	
5	R5a-11-B53	1022836.900	1892584.900	701.6	1022836.906	1892584.990	701.488	0.006	0.090	-0.112	
5	R5a-11-B54	1022815.600	1892584.800	702.6	1022815.571	1892584.787	702.566	-0.029	-0.013	-0.034	
5	R5a-11-B55	1022823.100	1892581.400	702.6	1022823.060	1892581.401	702.581	-0.040	0.001	-0.019	
5	R5a-11-B56	1022816.800	1892580.000	702.6	1022816.772	1892580.005	702.558	-0.028	0.005	-0.042	
5	R5a-11-B57	1022820.900	1892577.700	702.6	1022820.865	1892577.772	702.562	-0.035	0.072	-0.038	
5	R5a-11-B6	1022881.500	1892749.600	702.7	1022881.513	1892749.635	702.282	0.013	0.035	-0.418	
5	R5a-11-B7	1022922.600	1892748.400	701.9	1022922.567	1892748.353	700.439	-0.033	-0.047	-1.461	Excavated deeper due to backhoe ruts
5	R5a-11-B8	1022870.100	1892738.400	703	1022870.063	1892738.344	702.997	-0.037	-0.056	-0.003	
5	R5a-11-B9	1022923.700	1892737.500	701.5	1022923.612	1892737.439	699.730	-0.088	-0.061	-1.770	Excavated deeper due to backhoe ruts
5	R5a-11-V5b	1022887.100	1892734.700	702.3	1022887.107	1892734.795	702.132	0.007	0.095	-0.168	

Notes:

 Δ Elevation < -0.16 ft Blue Δ Easting/Northing < or = 0.2 ft Green Δ Elevation -0.16 to 0.0 ft Green Δ Easting/Northing > 0.2 ft Blue

Attachment E
Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-12

		Design				Actual			ata Compar		Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-12-9507b	1022328.800	1891780.200	698.7	1022328.856	1891780.207	698.273	0.056	0.007	-0.427	
5	R5a-12-9566b	1022333.500	1891795.900	699.6	1022333.467	1891795.849	699.485	-0.033	-0.051	-0.115	
5	R5a-12-9572b	1022321.300	1891766.000	698.9	1022321.312	1891766.023	698.852	0.012	0.023	-0.048	
5	R5a-12-9573b	1022318.100	1891767.400	699.5	1022318.100	1891767.353	699.039	0.000	-0.047	-0.461	
5	R5a-12-9652b	1022322.100	1891773.900	699.2	1022322.143	1891773.841	699.189	0.043	-0.059	-0.011	
5	R5a-12-B1	1022335.300	1891799.600	699.6	1022335.278	1891799.699	699.506	-0.022	0.099	-0.094	
5	R5a-12-B10	1022322.500	1891769.400		1022322.567			0.067	0.027	-0.032	
5	R5a-12-B11		1891768.800		1022313.984			-0.016	-0.020	-0.044	
5	R5a-12-B12	1022313.600	1891764.800	699.5	1022313.496	1891764.871	699.065	-0.104	0.071	-0.435	
5	R5a-12-B13	1022324.900	1891763.000	698.9	1022324.870	1891763.001	698.799	-0.030	0.001	-0.101	
5	R5a-12-B14	1022319.300	1891762.800		1022319.266			-0.034	0.071	-0.022	
5	R5a-12-B2	1022332.600	1891796.000		1022332.627			0.027	-0.081	-0.018	
5	R5a-12-B3	1022337.200	1891794.300	699.6	1022337.191	1891794.183	699.436	-0.009	-0.117	-0.164	
5	R5a-12-B4	1022330.300	1891788.200	698.7	1022330.192	1891788.214	698.429	-0.108	0.014	-0.271	
5	R5a-12-B5	1022334.900	1891786.500	698.7	1022334.780	1891786.431	698.231	-0.120	-0.069	-0.469	
5	R5a-12-B6	1022327.400	1891780.700	698.7				-0.052	-0.026	-0.448	·
5	R5a-12-B7	1022331.700	1891778.900	698.7	1022331.680	1891778.886	698.636	-0.020	-0.014	-0.064	·
5	R5a-12-B8	1022319.200	1891775.700	699.2	1022319.260	1891775.755	699.032	0.060	0.055	-0.168	·
5	R5a-12-B9	1022322.900	1891773.300	699.2	1022323.063	1891773.360	698.954	0.163	0.060	-0.246	<u>-</u>

Notes:

 $\begin{array}{ll} \hline \Delta \ \, \text{Elevation} < \text{-0.25 ft Blue} & \Delta \ \, \text{Easting/Northing} < \text{or} = 0.2 \ \text{ft Green} \\ \Delta \ \, \text{Elevation} \ \, \text{-0.25 to} \ \, 0.0 \ \text{ft Green} & \Delta \ \, \text{Easting/Northing} > 0.2 \ \text{ft Blue} \\ \end{array}$

Attachment E Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-13

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design				Actual		Da	ta Compari	ison	Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	∆ Northing	∆ Elevation	
5	R5a-13-9649b	1022332.800	1891763.800	698.5	1022332.736	1891763.821	698.061	-0.064	0.021	-0.439	
5	R5a-13-B1	1022334.400	1891767.200	698.5	1022334.418	1891767.227	698.181	0.018	0.027	-0.319	
5	R5a-13-B2	1022330.400	1891764.000	698.5	1022330.462	1891763.938	697.927	0.062	-0.062	-0.573	
5	R5a-13-B3	1022338.900	1891762.000	698.5	1022338.945	1891761.928	698.359	0.045	-0.072	-0.141	
5	R5a-13-B4	1022333.800	1891760.100	698.5	1022333.826	1891760.186	698.297	0.026	0.086	-0.203	
5	R5a-13-B5	1022336.800	1891760.000	698.5	1022336.903	1891760.015	698.337	0.103	0.015	-0.163	

Notes:

 $\overline{\Delta}$ Elevation < -0.25 ft Blue Δ Elevation -0.25 to 0.0 ft Green Δ Elevation -0.25 to 0.0 ft Green Δ Easting/Northing > 0.2 ft Blue

Comprehensive GPS Verification Survey for the Bottom of Targeted Material - Reach 5A-14

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Design			Actual				ata Compar		Comments
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	∆ Easting	△ Northing	∆ Elevation	
5	R5a-14-9503b	1022316.500	1891750.400	700.6	1022316.429	1891750.471	699.871	-0.071	0.071	-0.729	
5	R5a-14-B1	1022316.900	1891755.000	700.6	1022316.901	1891754.928	700.350	0.001	-0.072	-0.250	
5	R5a-14-B2	1022313.000	1891754.800	700.6	1022312.888	1891754.741	699.628	-0.112	-0.059	-0.972	
5	R5a-14-B3	1022317.800	1891750.400	700.6	1022317.722	1891750.377	699.827	-0.078	-0.023	-0.773	
5	R5a-14-B4	1022312.600	1891750.300	700.6	1022312.630	1891750.212	700.575	0.030	-0.088	-0.025	
5	R5a-14-B5	1022317.200	1891745.400	700.6	1022317.235	1891745.321	700.295	0.035	-0.079	-0.305	
5	R5a-14-B6	1022313.300	1891745.300	700.6	1022313.237	1891745.349	700.137	-0.063	0.049	-0.463	

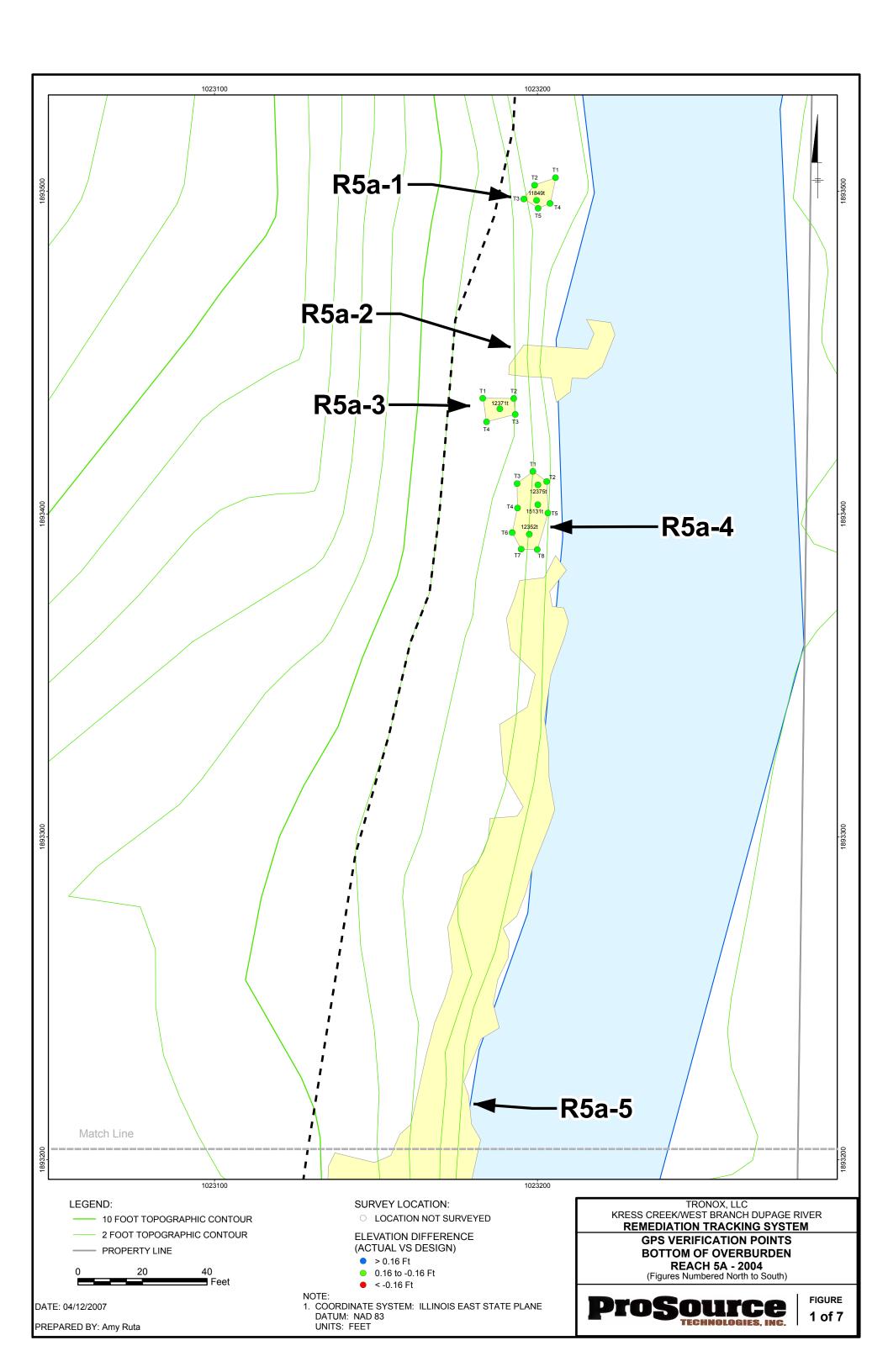
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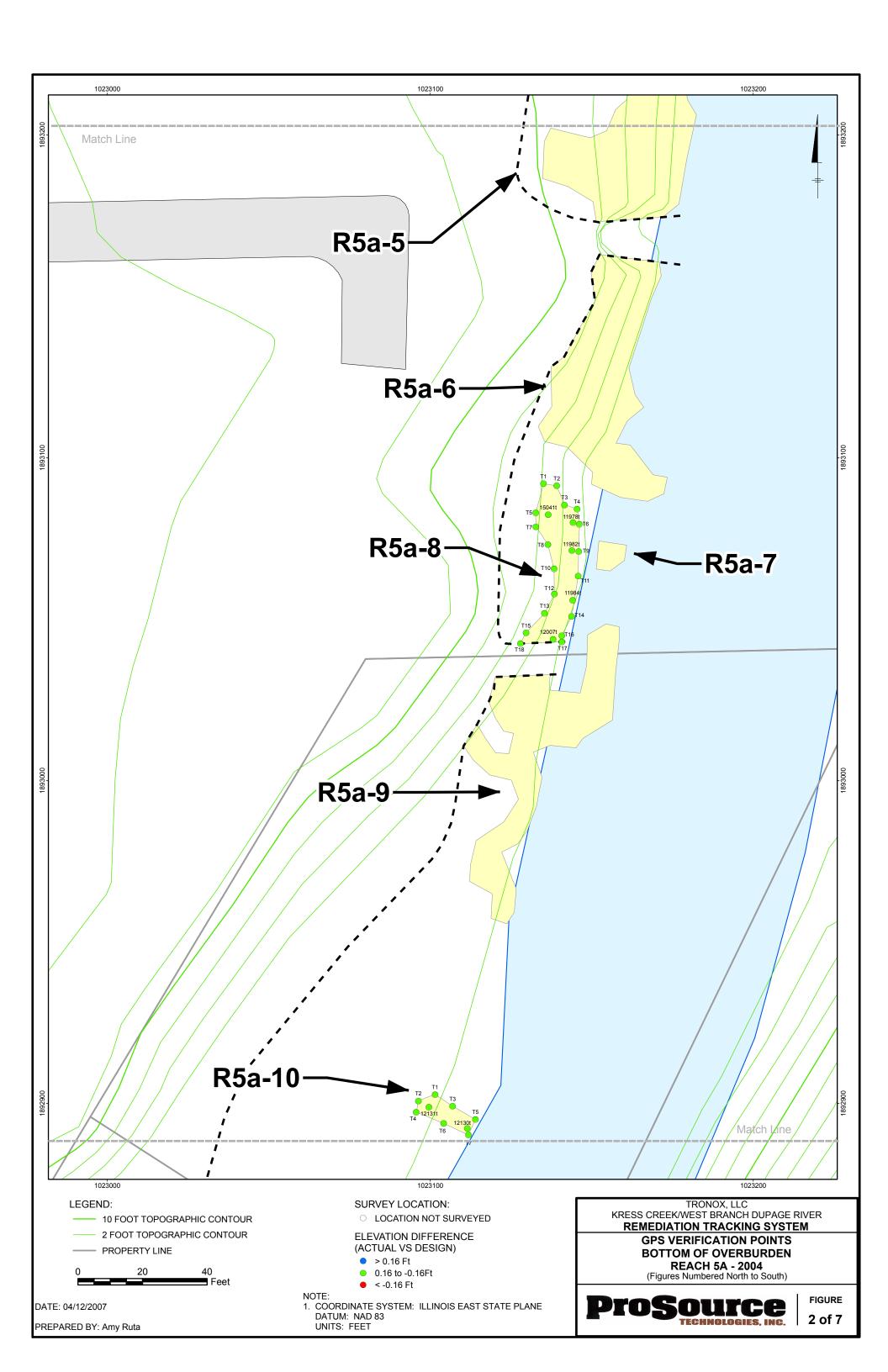
 $\overline{\Delta}$ Elevation < -0.25 ft Blue Δ Easting/Northing < or = 0.2 ft Green Δ Elevation -0.25 to 0.0 ft Green Δ Easting/Northing > 0.2 ft Blue

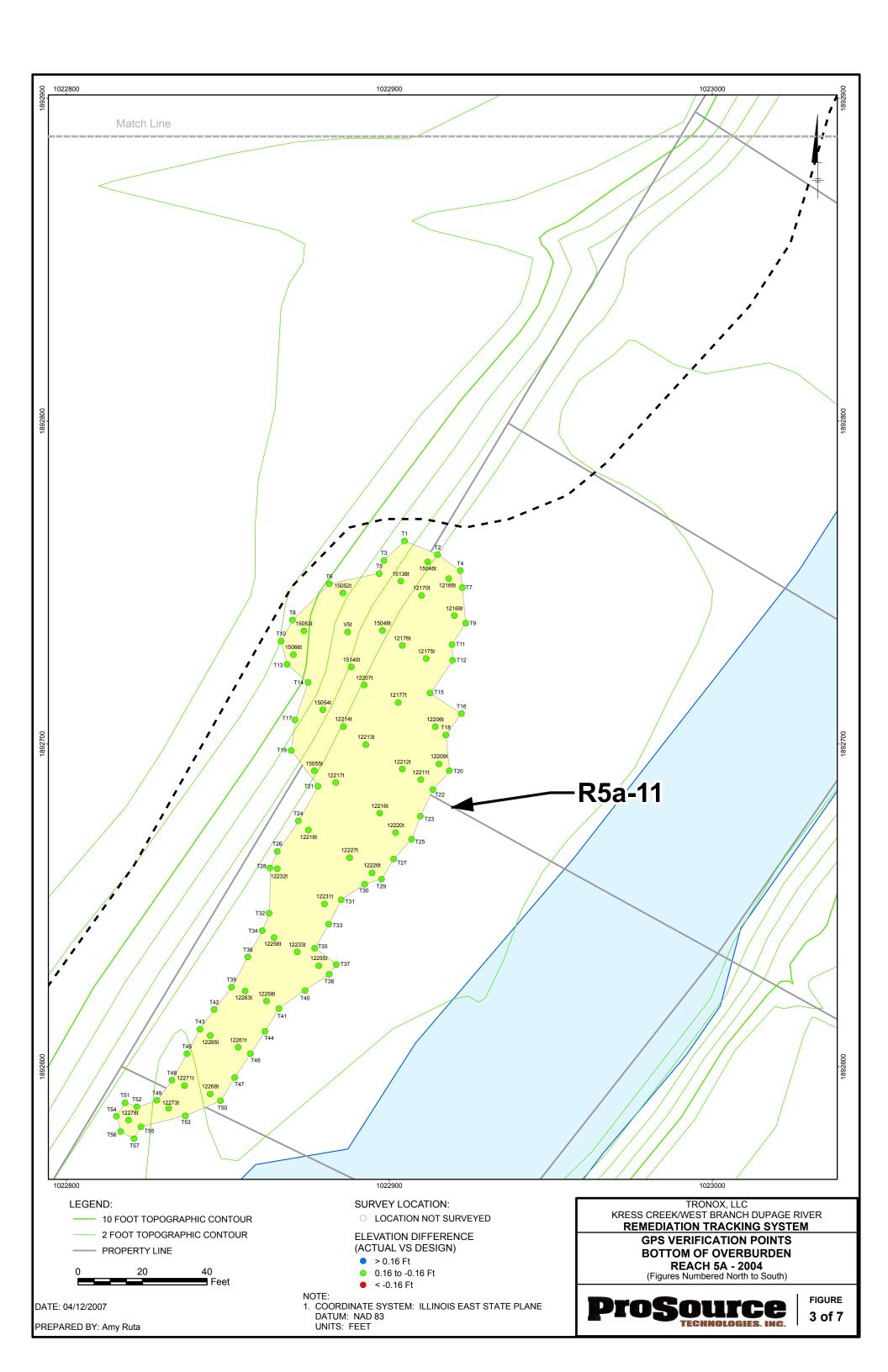
ARCADIS BBL

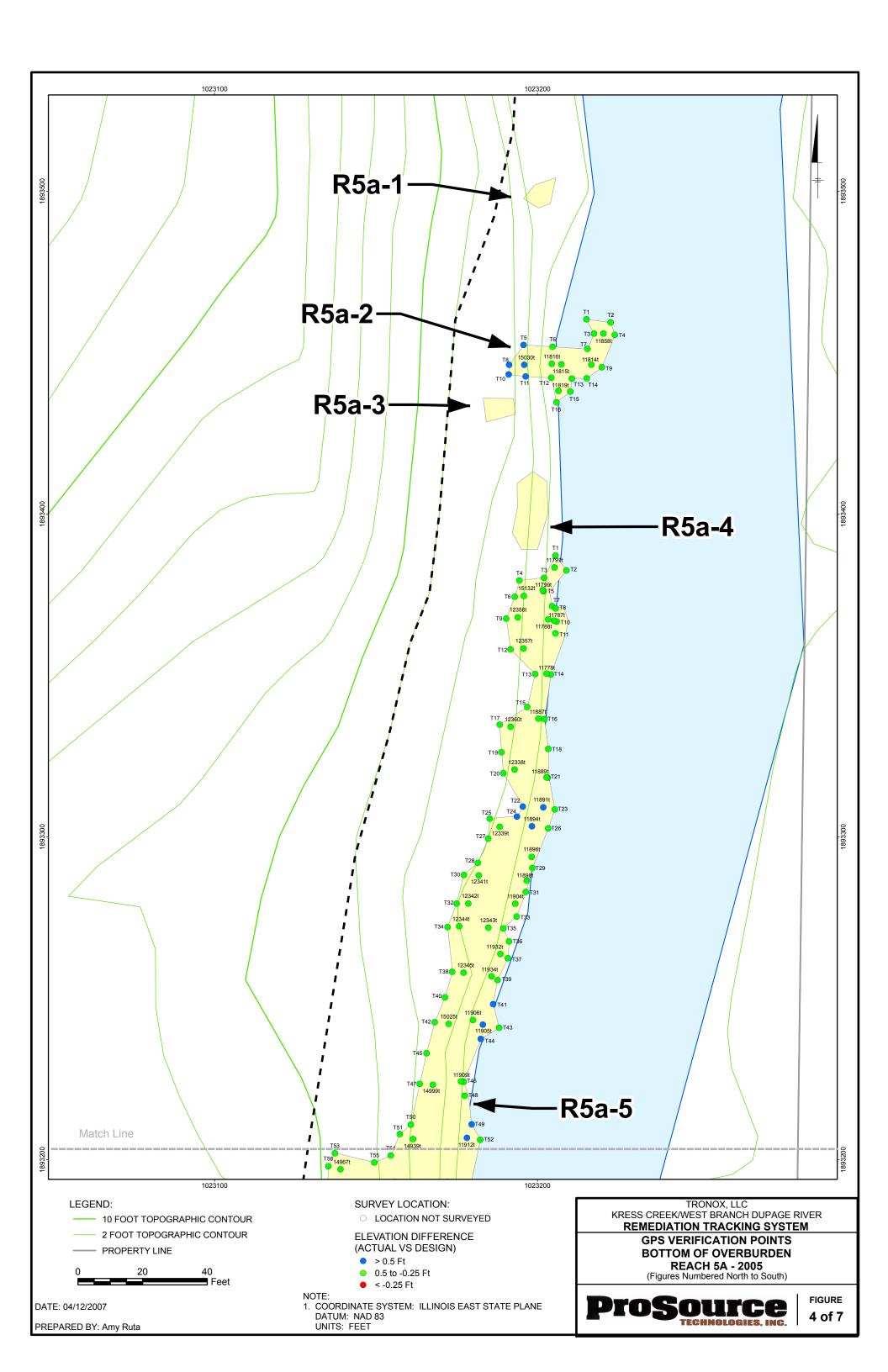
Appendix F

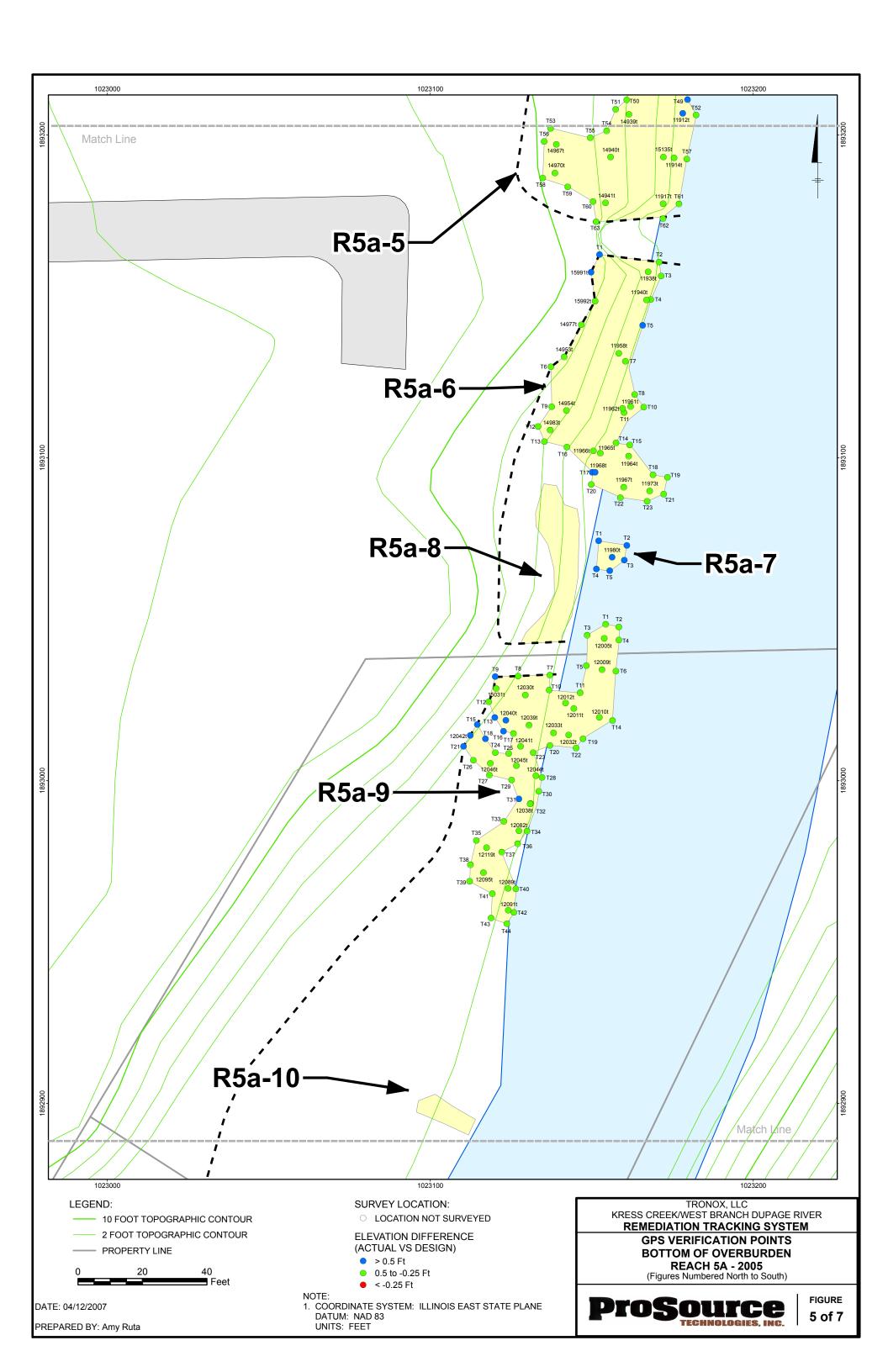
GPS Verification Points Figures (1 through 7), Bottom of Overburden, Reach 5A

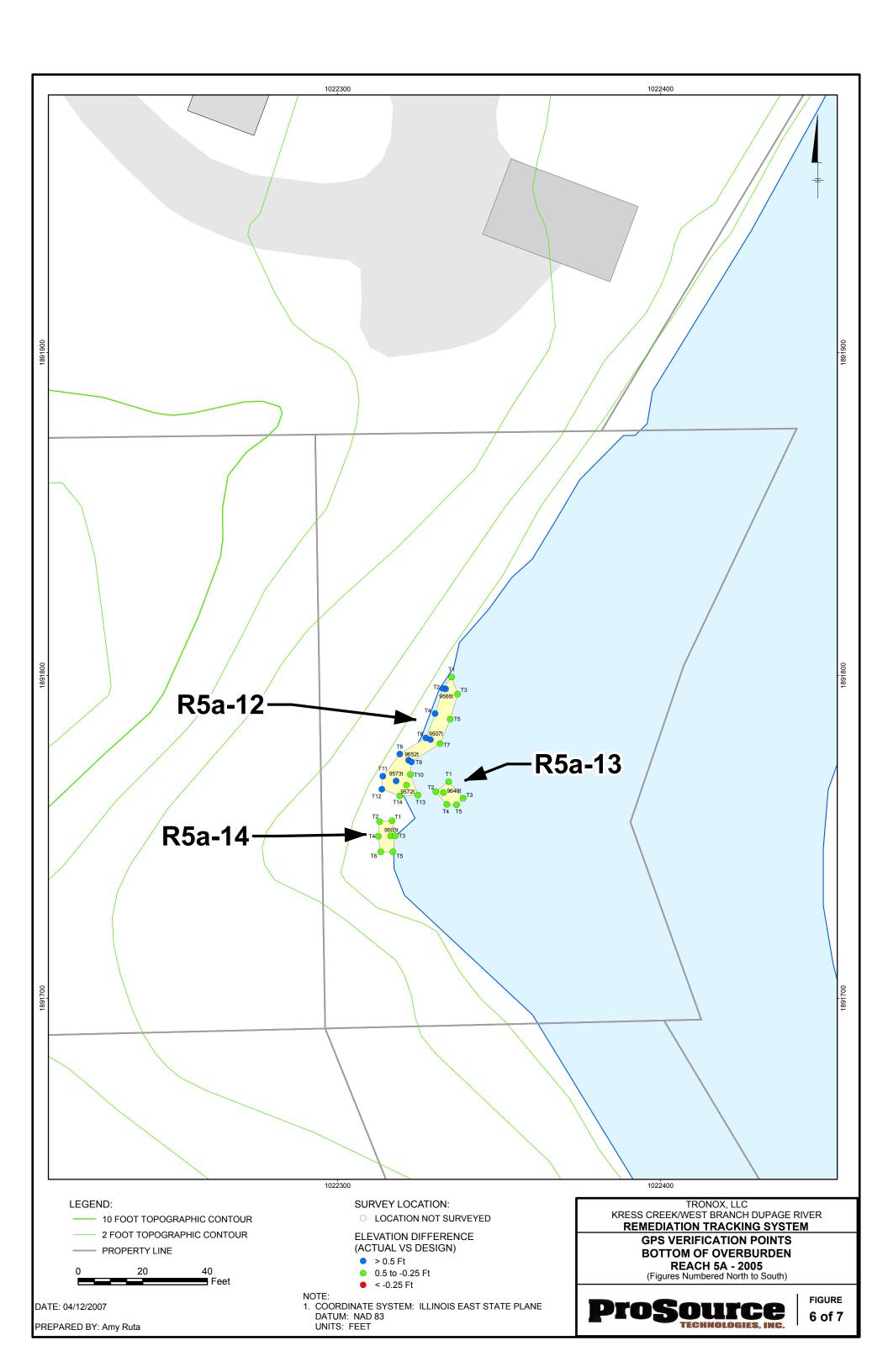


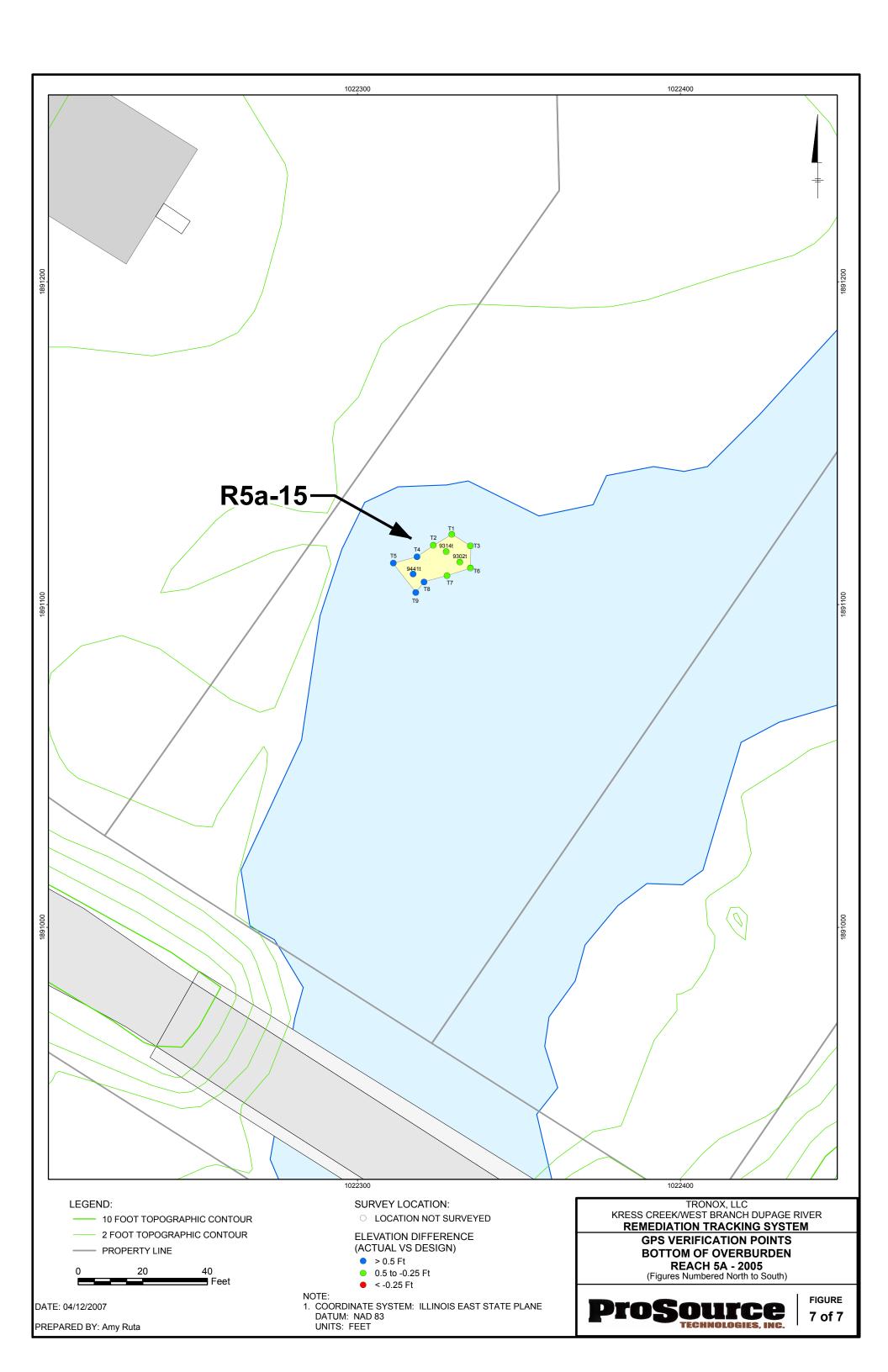








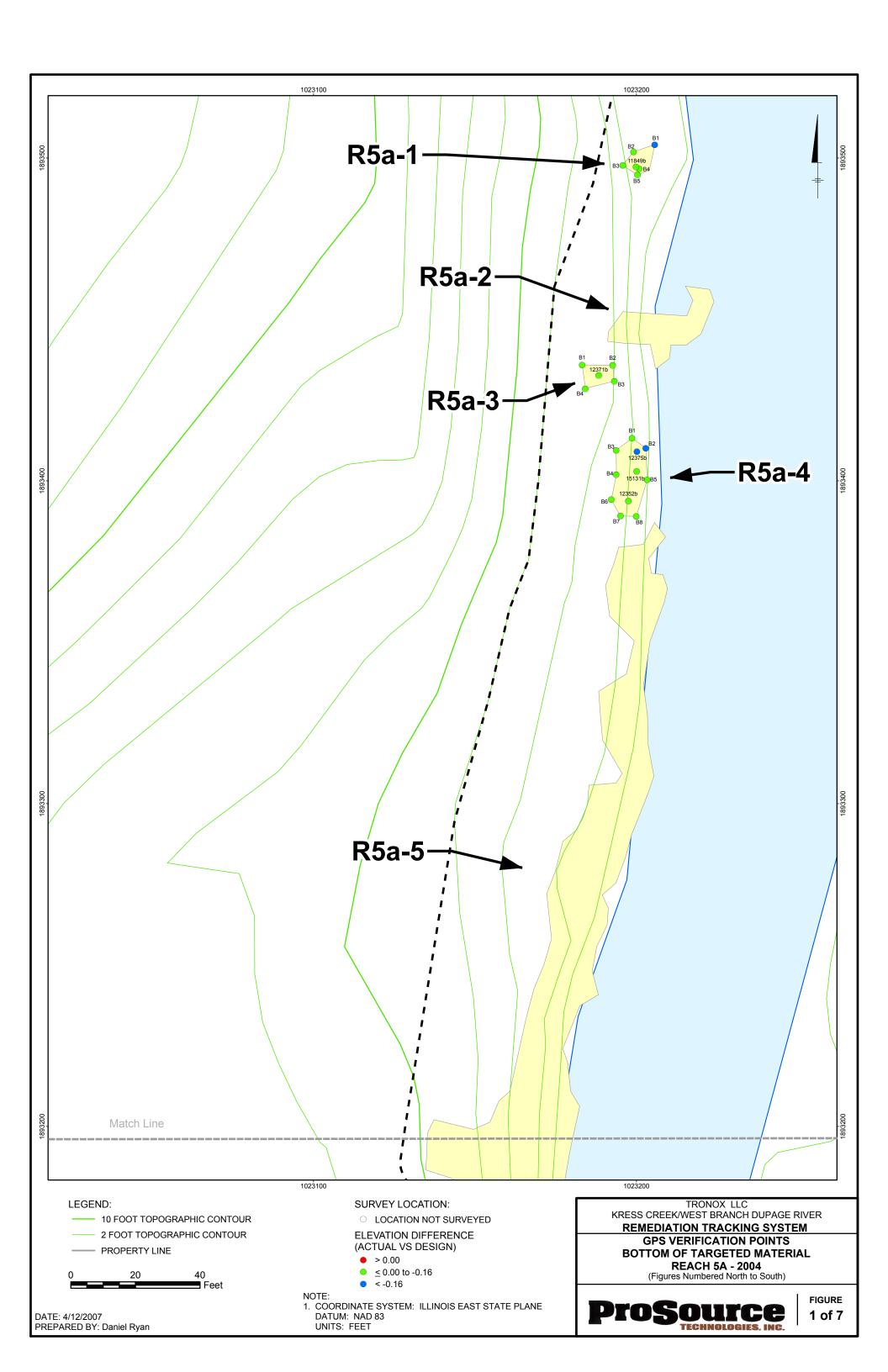


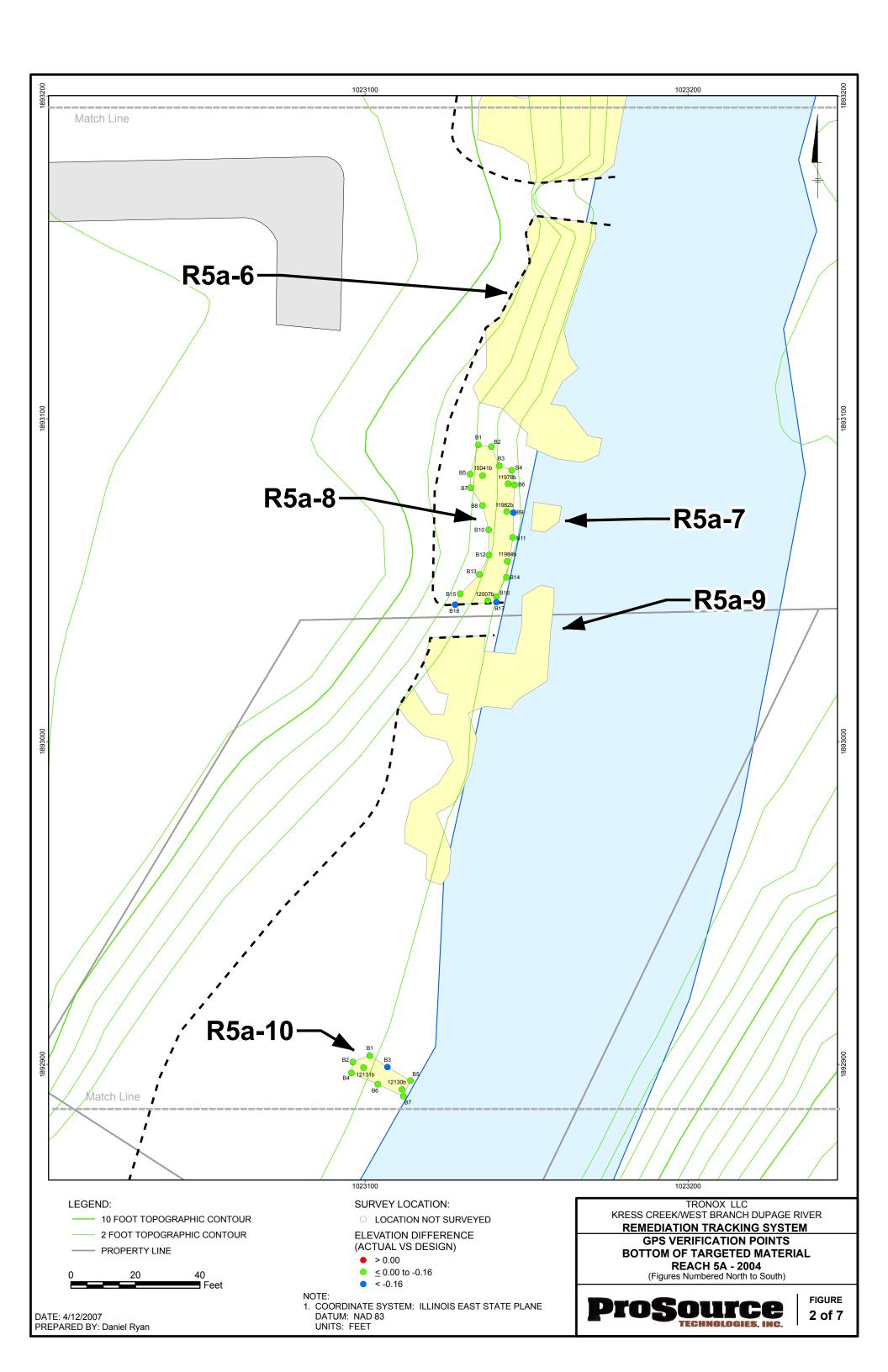


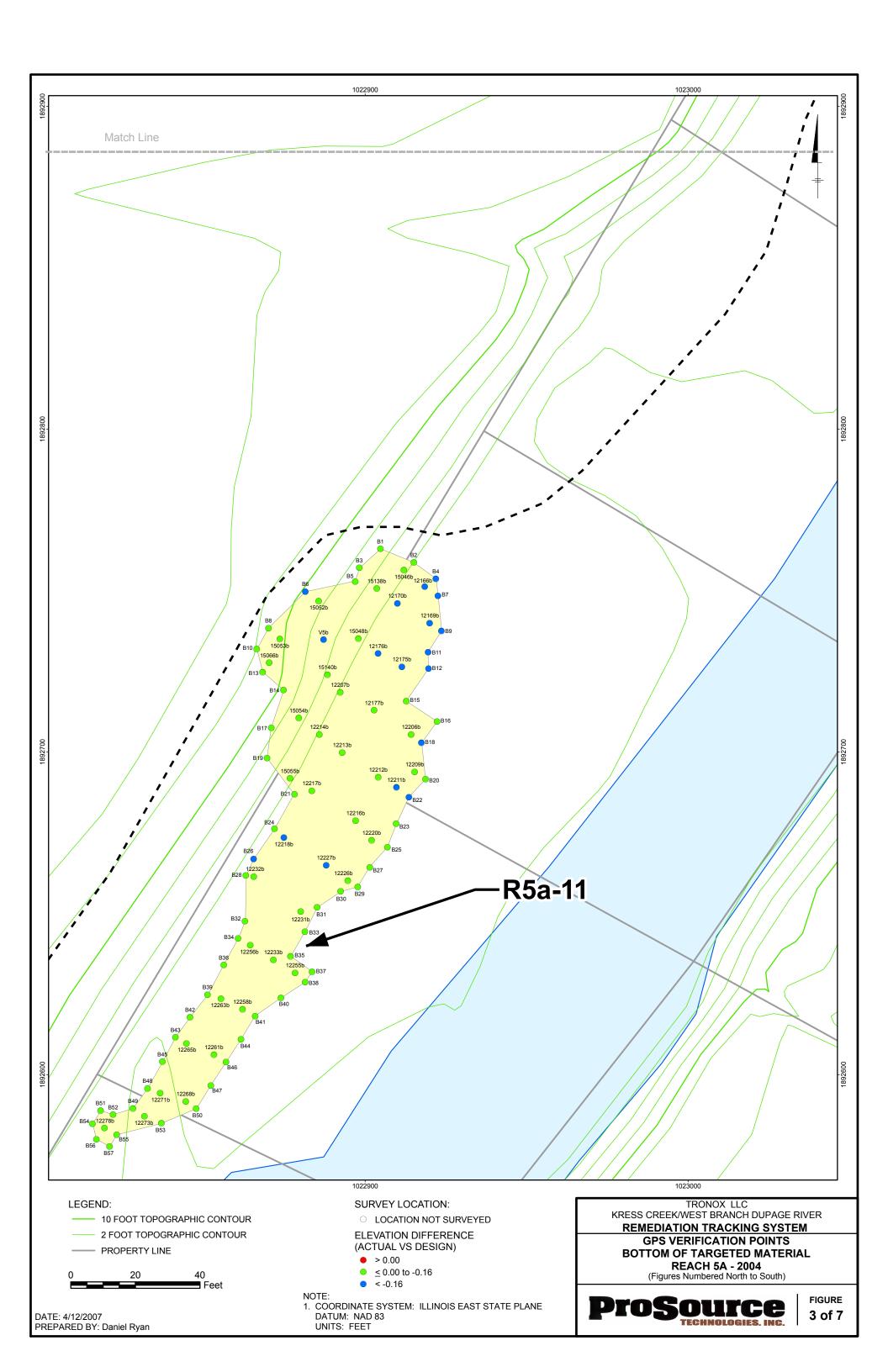
ARCADIS BBL

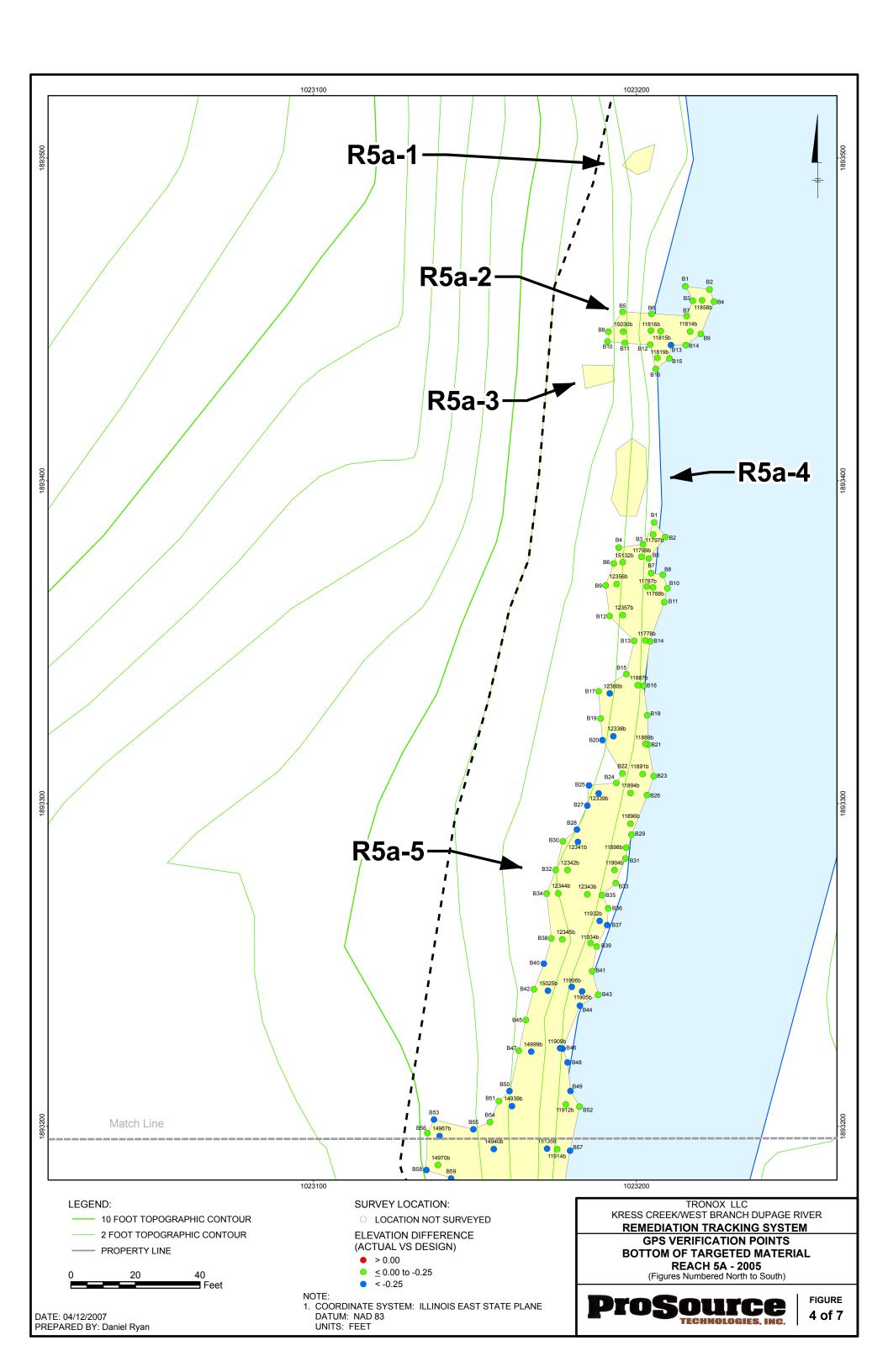
Appendix G

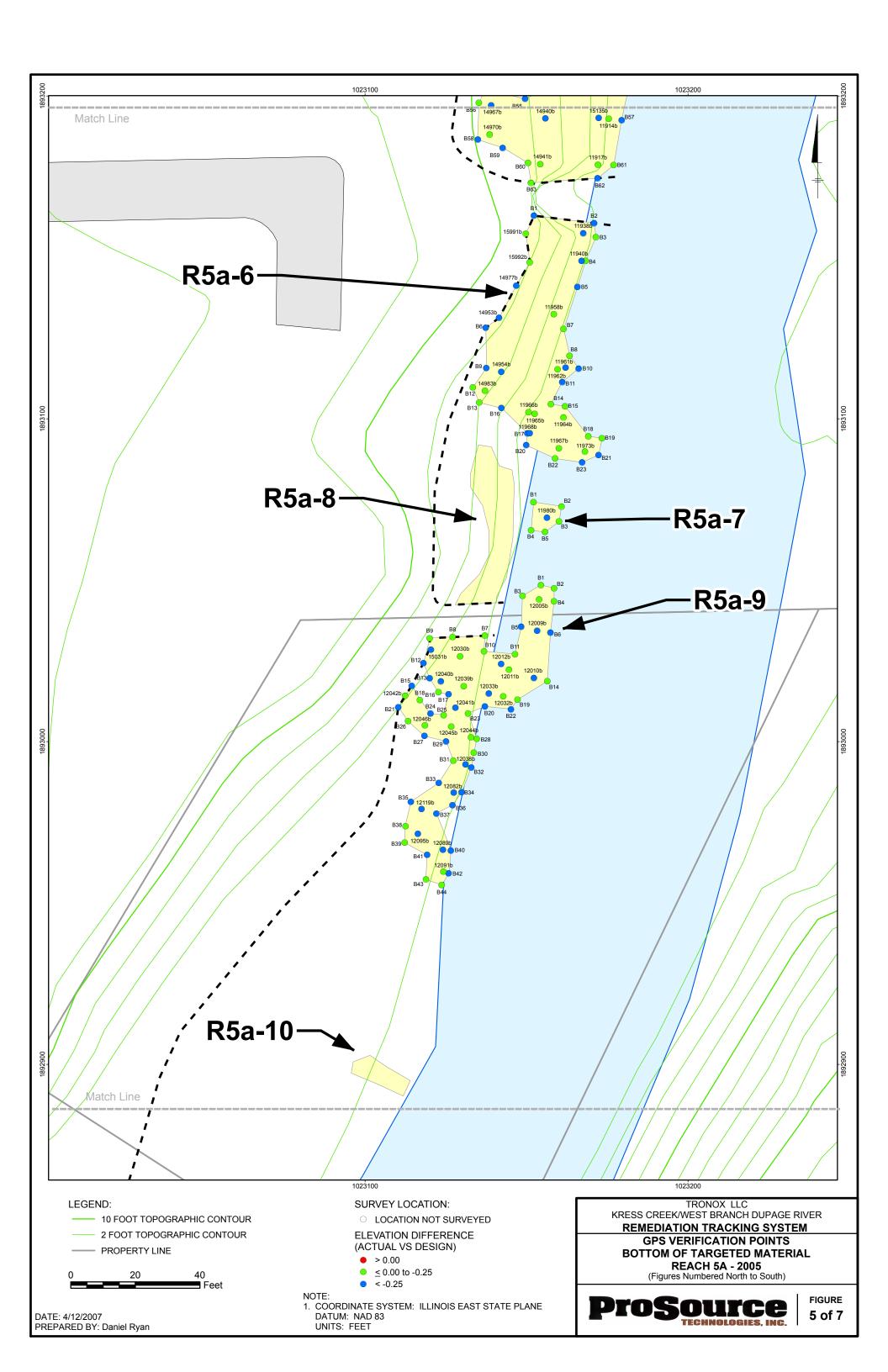
GPS Verification Points Figures (1 through 7), Bottom of Targeted Material, Reach 5A

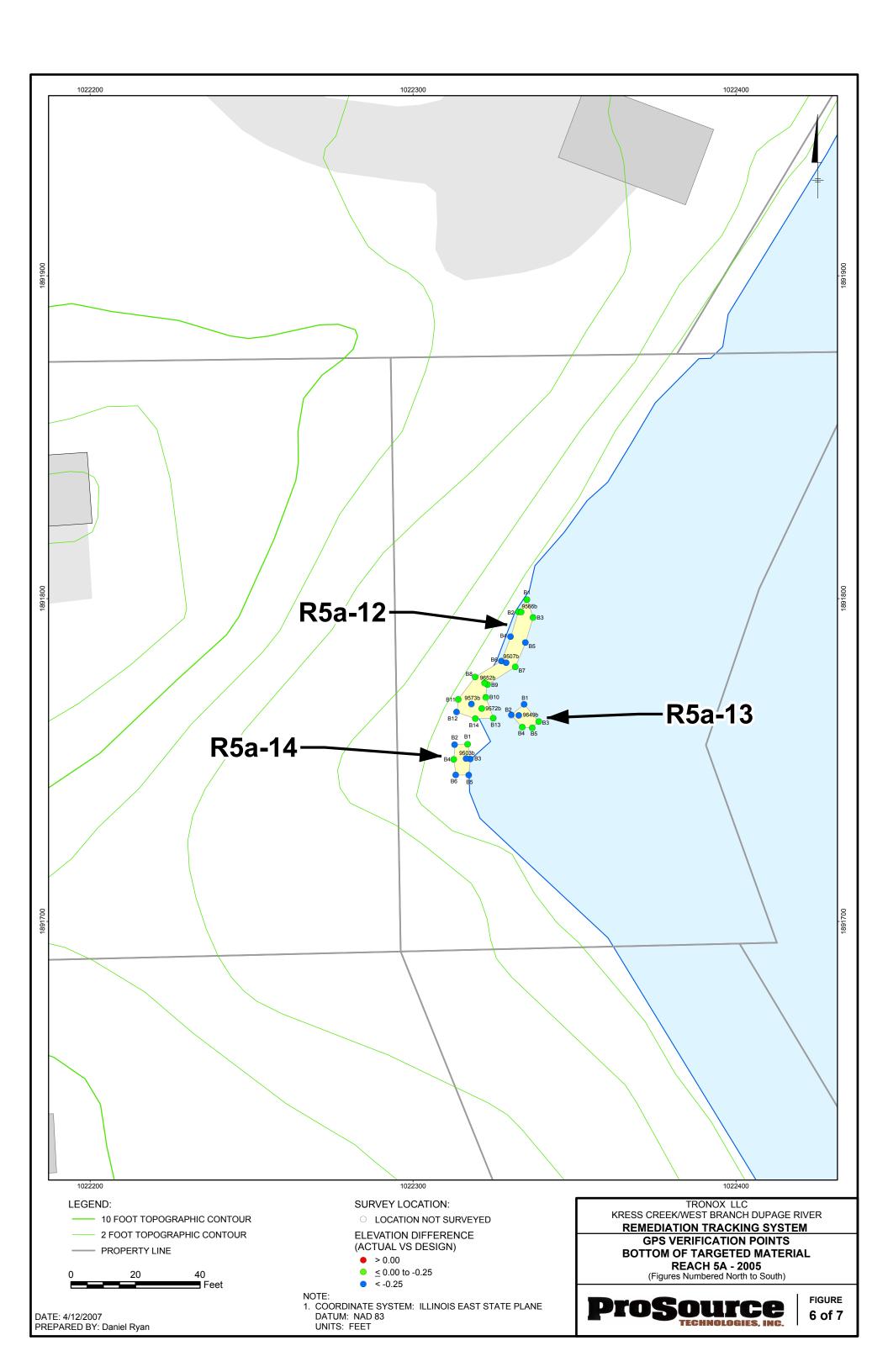


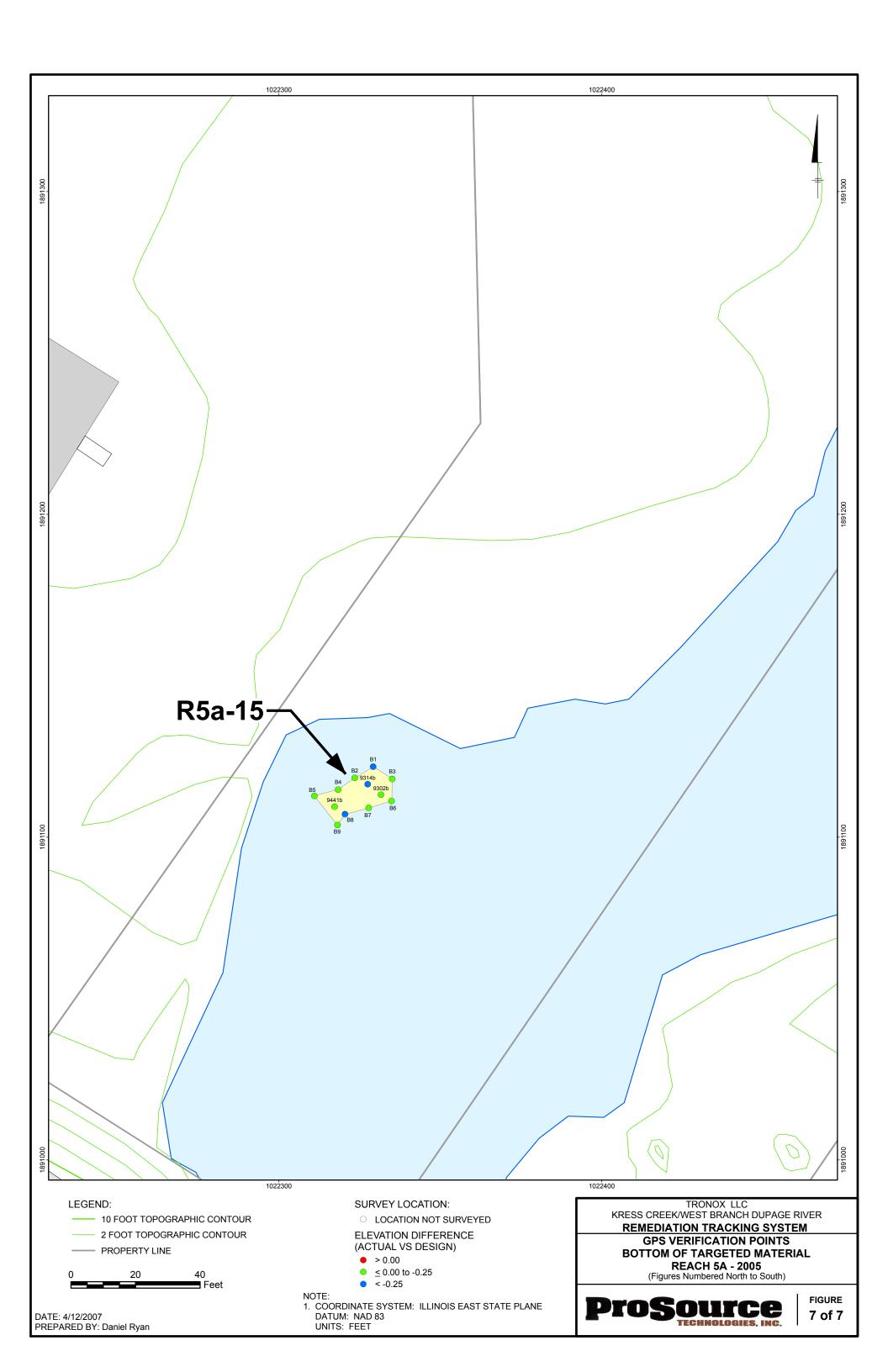














Appendix H

Record Drawings

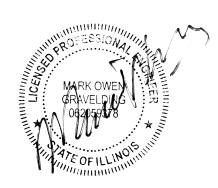
RECORD DRAWINGS

REMEDIAL ACTION FOR REACH 5A KRESS CREEK/WEST BRANCH Dupage RIVER SITE AND THE RIVER PORTION OF THE SEWAGE TREATMENT PLANT SITE

BLACKWELL"

Dupage County, IL

RELEASED - APRIL 2008 REVISED - JUNE 2008 TRONOX LLC





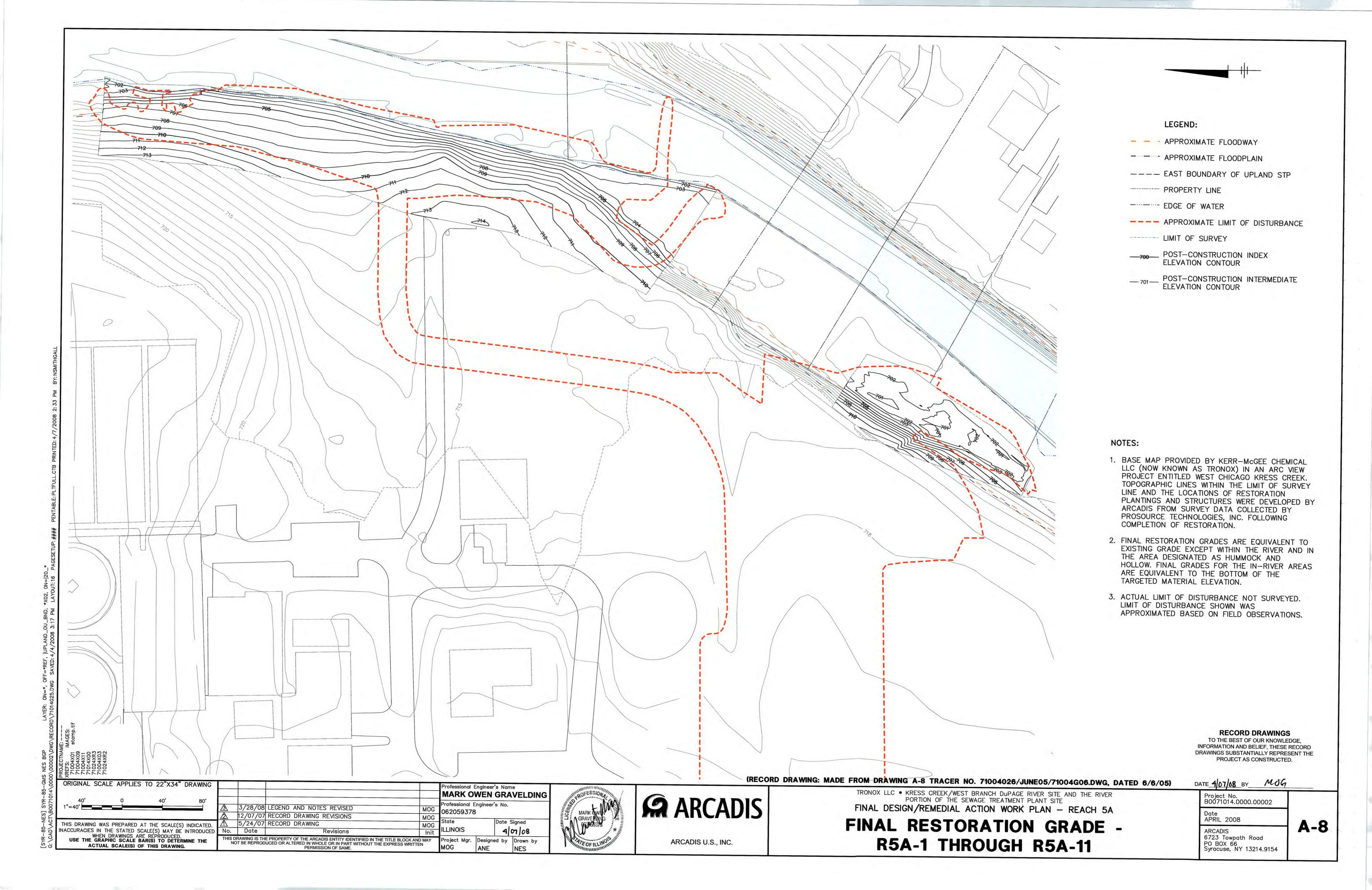
RECORD DRAWINGS

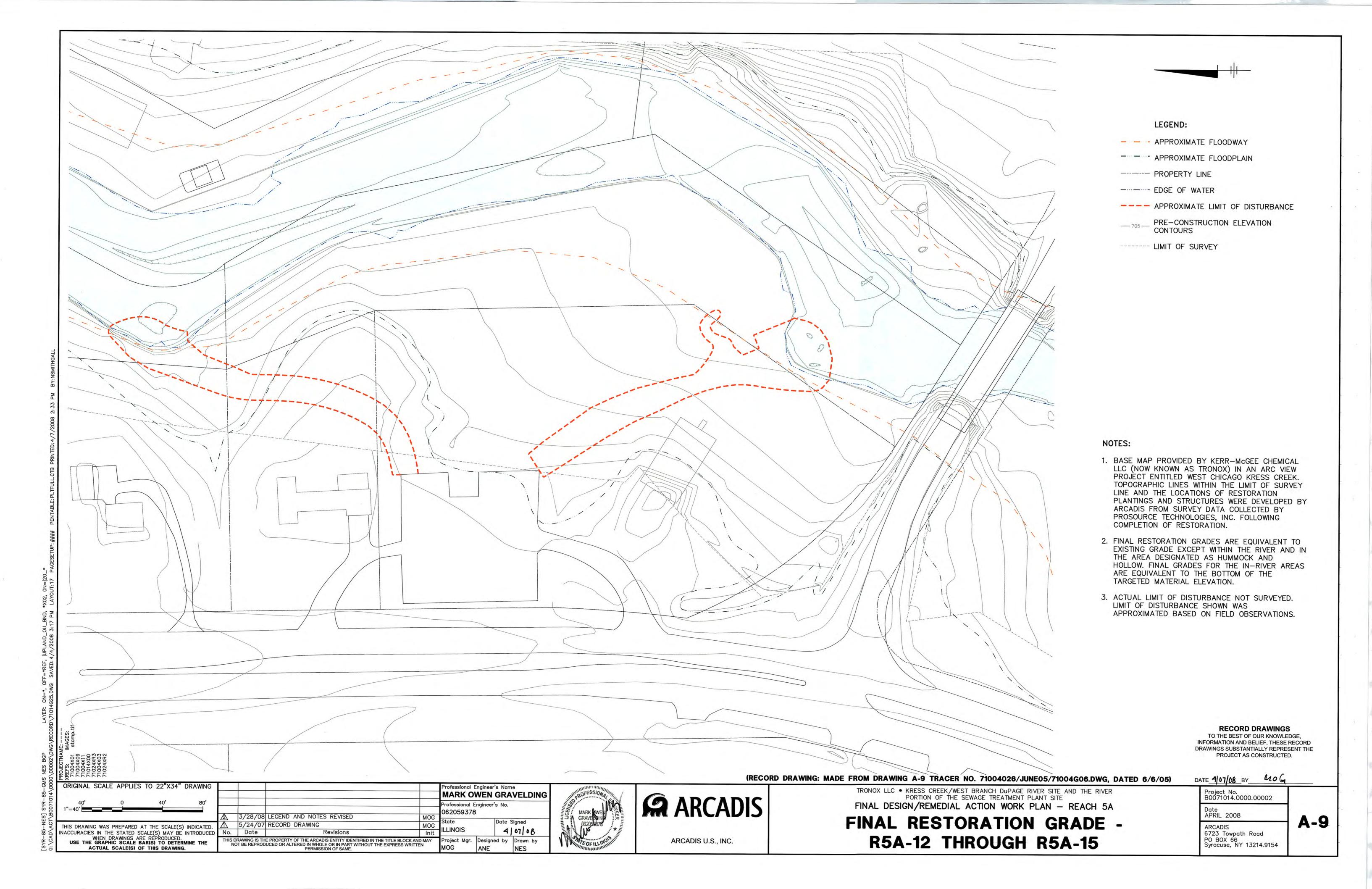
TO THE BEST OF OUR KNOWLEDGE,
INFORMATION AND BELIEF, THESE RECOR
DRAWINGS SUBSTANTIALLY REPRESENT
THE PROJECT AS CONSTRUCTED.

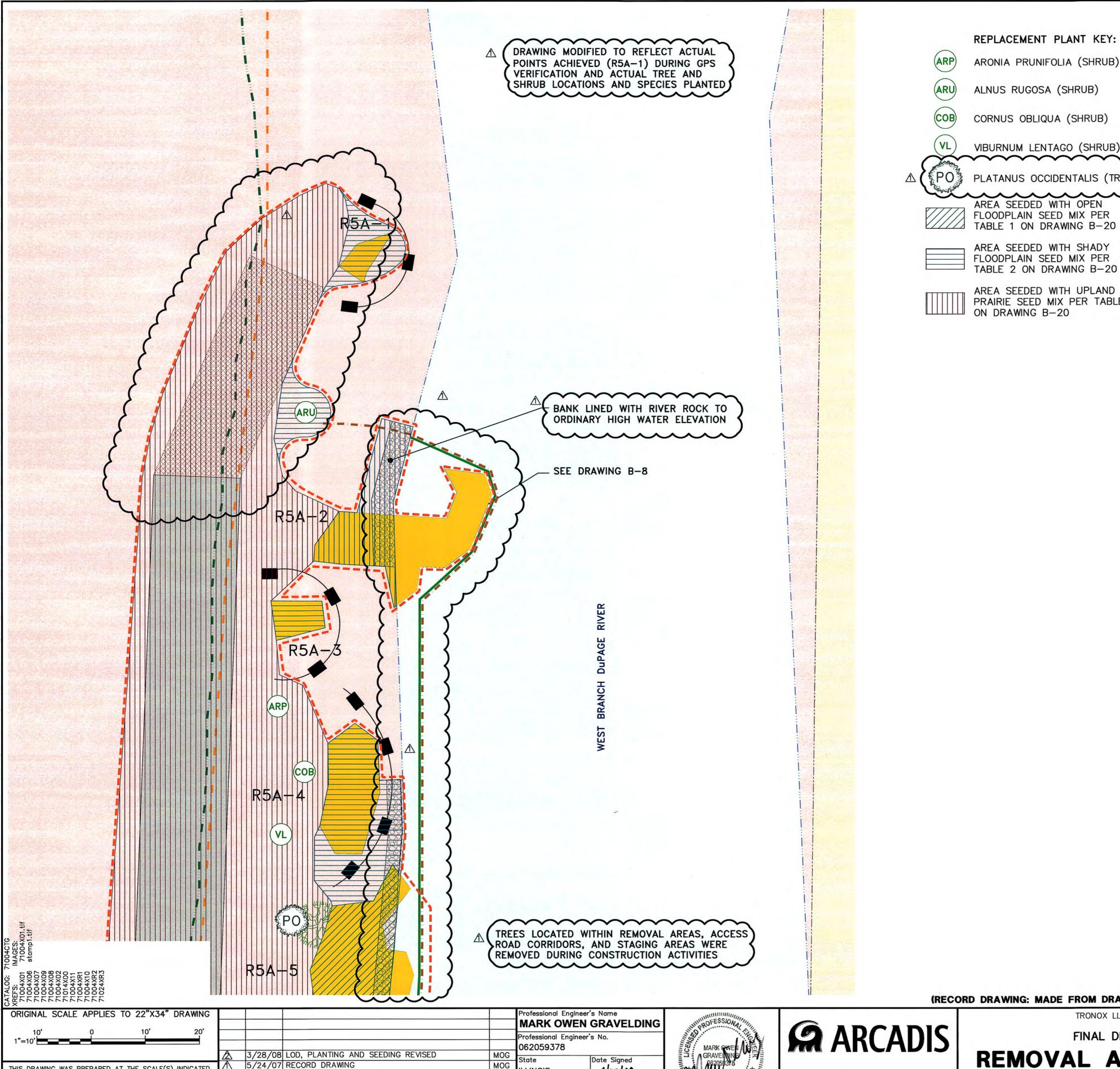
DATE 6-9-08 BY MOG

INDEX OF DRAWINGS (REVISED JUNE 2008 - DRAWINGS REMOVED FROM SET)

- A-1 TITLE SHEET
- A-8 FINAL RESTORATION GRADE R5A-1 THROUGH R5A-11
- A-9 FINAL RESTORATION GRADE R5A-12 THROUGH R5A-15
- B-7 REMOVAL AREAS R5A-1, R5A-3, AND R5A-4 RESTORATION PLAN
- B-8 REMOVAL AREA R5A-2 RESTORATION PLAN
- B-9 REMOVAL AREA R5A-5 RESTORATION PLAN
- B-10 REMOVAL AREA R5A-6 RESTORATION PLAN
- B-11 REMOVAL AREAS R5A-7 AND R5A-8 RESTORATION PLAN
- B-12 REMOVAL AREA R5A-9 RESTORATION PLAN
- B-13 REMOVAL AREA R5A-10 RESTORATION PLAN
- B-14 REMOVAL AREA R5A-11 RESTORATION PLAN
- B-15 REMOVAL AREAS R5A-12 AND R5A-13 RESTORATION PLAN
- -16 REMOVAL AREA R5A-14 RESTORATION PLAN
- B-17 REMOVAL AREA R5A-15 RESTORATION PLAN
- B-18 RD1 AND STAGING AREA RESTORATION PLAN
- B-19 RD2 AND RD3 RESTORATION PLAN
- B-20 SEED MIXES REACH 5A
- B-21 VEGETATION RESTORATION PLAN R5A-1 THROUGH R5A-11
- B-22 VEGETATION RESTORATION PLAN R5A-12 THROUGH R5A-15







LEGEND: REPLACEMENT PLANT KEY: LAND USE KEY ARONIA PRUNIFOLIA (SHRUB) REMOVAL AREA FOREST PRESERVE RESIDENTIAL PROPOSED HAUL/ACCESS ROAD ALNUS RUGOSA (SHRUB) PARK - APPROXIMATE FLOODWAY CORNUS OBLIQUA (SHRUB) COMMERCIAL ----- APPROXIMATE FLOODPLAIN VIBURNUM LENTAGO (SHRUB) GOVERNMENT ----- EDGE OF WATER NOTES: APPROXIMATE LIMIT OF PLATANUS OCCIDENTALIS (TREE) DISTURBANCE - - WATER RETENTION STRUCTURE AREA SEEDED WITH OPEN FLOODPLAIN SEED MIX PER

STAKED TURBIDITY CURTAIN

AREA SEEDED WITH SHADY FLOODPLAIN SEED MIX PER TABLE 2 ON DRAWING B-20 AREA SEEDED WITH UPLAND PRAIRIE SEED MIX PER TABLE 3

ON DRAWING B-20

— SILT FENCE E EXISTING TREE > 6" DBH 多年(SEE TABLE B-9)

ACCESS ROUTE (WITHOUT STONE)

ROCK LINED BANK

- 1. BASE MAP PROVIDED BY KERR-McGEE CHEMICAL LLC (NOW KNOWN AS TRONOX) IN AN ARC VIEW PROJECT ENTITLED WEST CHICAGO KRESS CREEK. LOCATIONS OF RESTORATION PLANTINGS AND STRUCTURES WERE DEVELOPED BY ARCADIS FROM SURVEY DATA COLLECTED BY PROSOURCE TECHNOLOGIES, INC. FOLLOWING COMPLETION OF RESTORATION.
- 2. THE LOCATION OF ALL STAGING AREAS AND PROPOSED HAUL/ACCESS ROADS IS APPROXIMATE.
- 3. FINAL GRADES SHOWN ON DRAWING A-8.
- 4. ALL SHRUBS ARE 1-GALLON CONTAINER
- 5. TREE/SHRUB PLANTING LOCATIONS ARE APPROXIMATE. ACTUAL LOCATIONS ARE TO BE FIELD DETERMINED.
- 6. ACTUAL LIMIT OF DISTURBANCE NOT SURVEYED. LIMIT OF DISTURBANCE SHOWN WAS APPROXIMATED BASED ON FIELD OBSERVATIONS.

RECORD DRAWINGS TO THE BEST OF OUR KNOWLEDGE INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

(RECORD DRAWING: MADE FROM DRAWING B-7 TRACER NO. 71004026/JUNE05/71004G10.DWG, DATED 6/6/05)

DATE 4/07/8 BY MOG

TRONOX LLC • KRESS CREEK/WEST BRANCH DuPAGE RIVER SITE AND THE RIVER PORTION OF THE SEWAGE TREATMENT PLANT SITE FINAL DESIGN/REMEDIAL ACTION WORK PLAN - REACH 5A

REMOVAL AREAS R5A-1, R5A-3, AND R5A-4 RESTORATION PLAN

B0071014.0000.00002 Date APRIL 2008 ARCADIS 6723 Towpath Road PO BOX 66 Syracuse, NY 13214.9154

5/24/07 RECORD DRAWING 4/07/08 THIS DRAWING WAS PREPARED AT THE SCALE(S) INDICATED ILLINOIS NACCURACIES IN THE STATED SCALE(S) MAY BE INTRODUCED.

WHEN DRAWINGS ARE REPRODUCED.

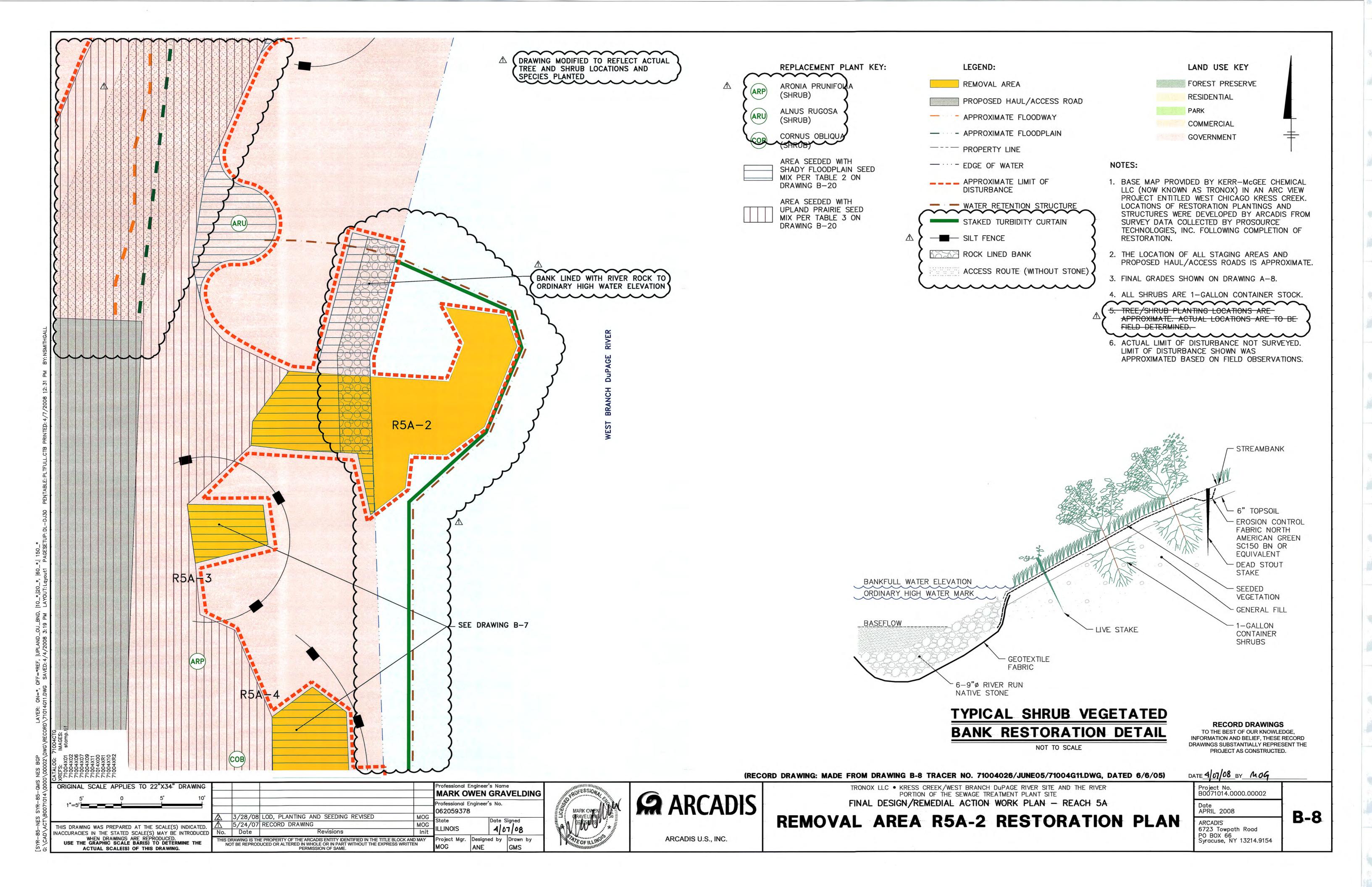
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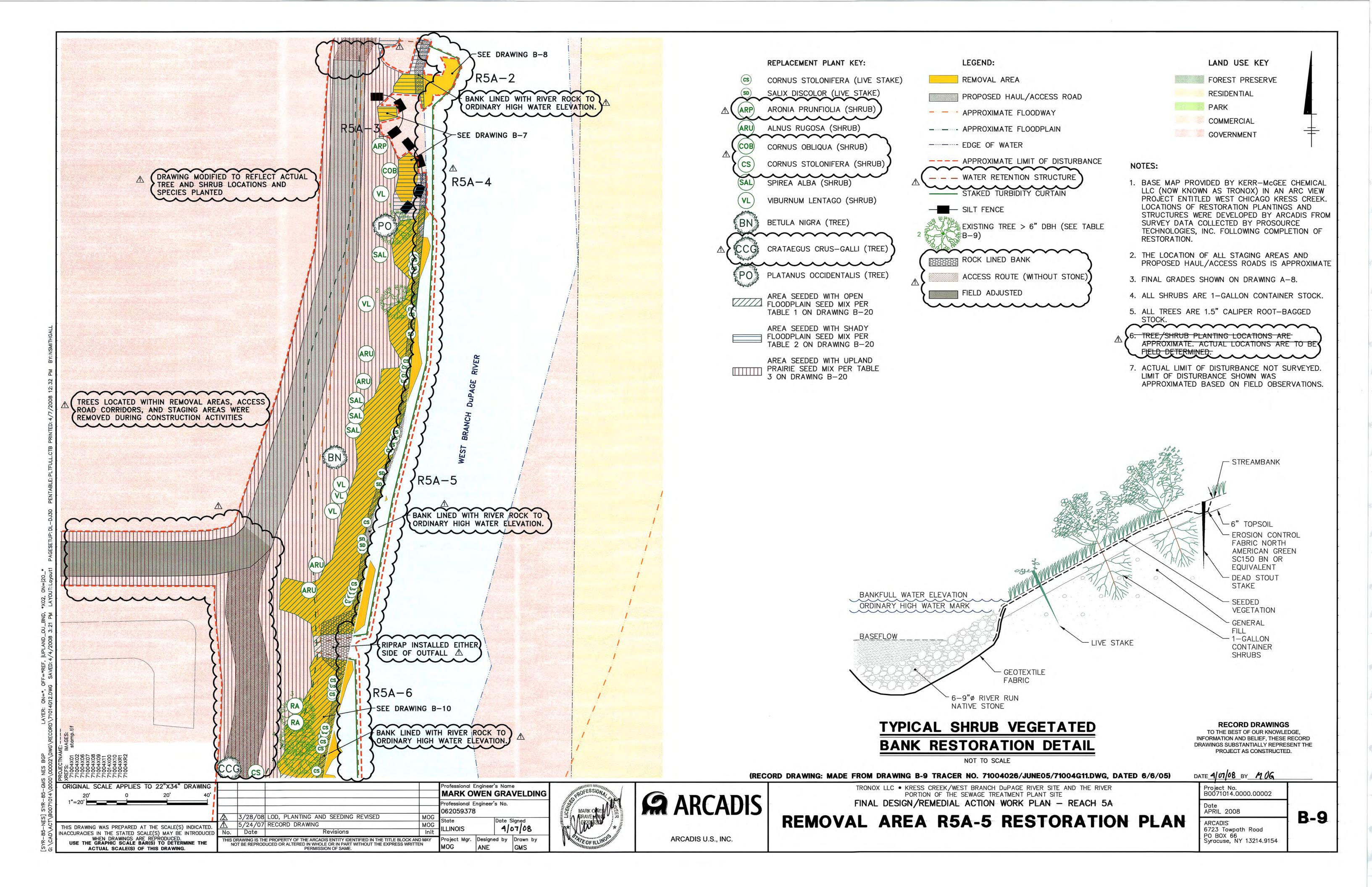
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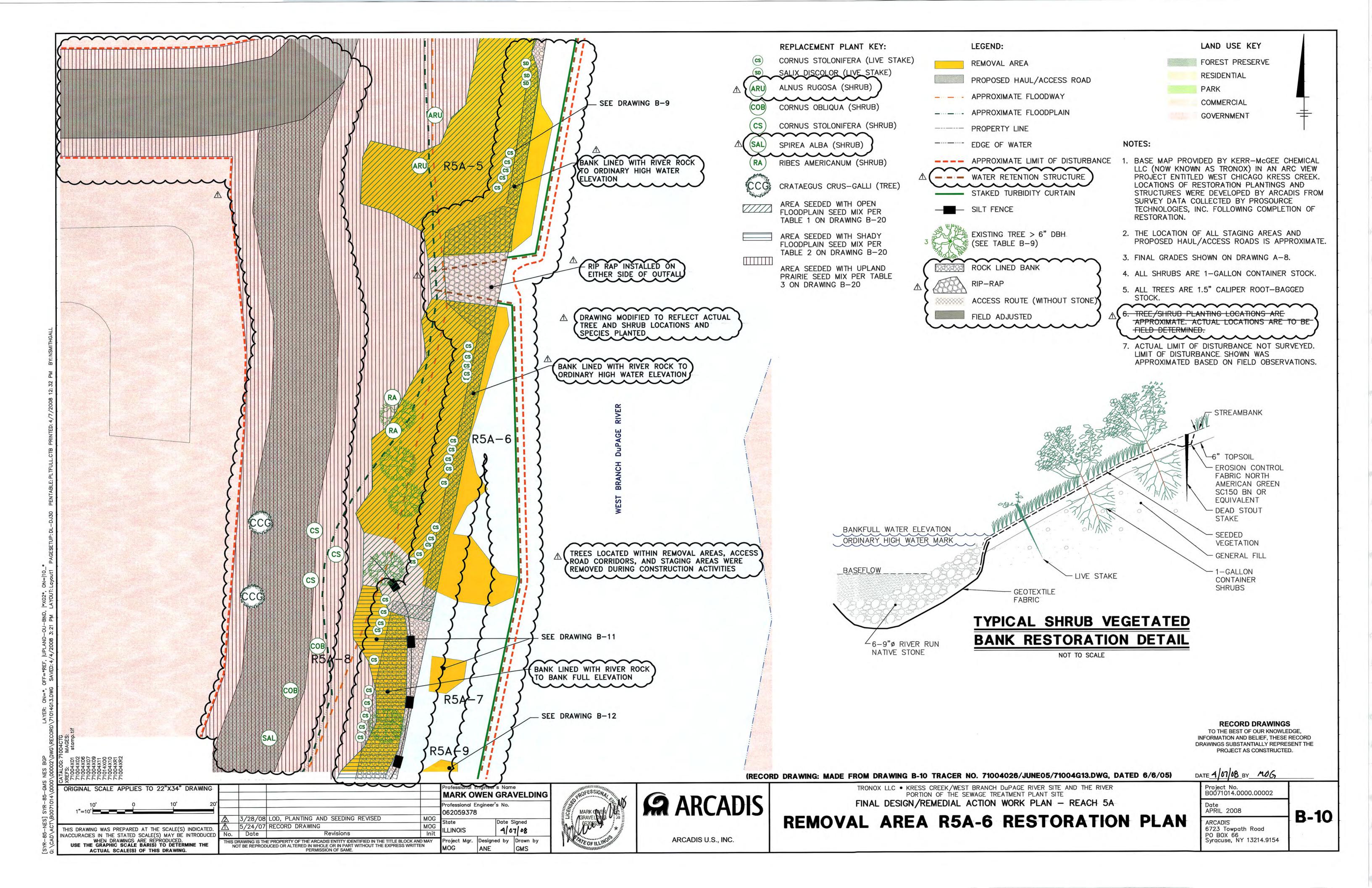


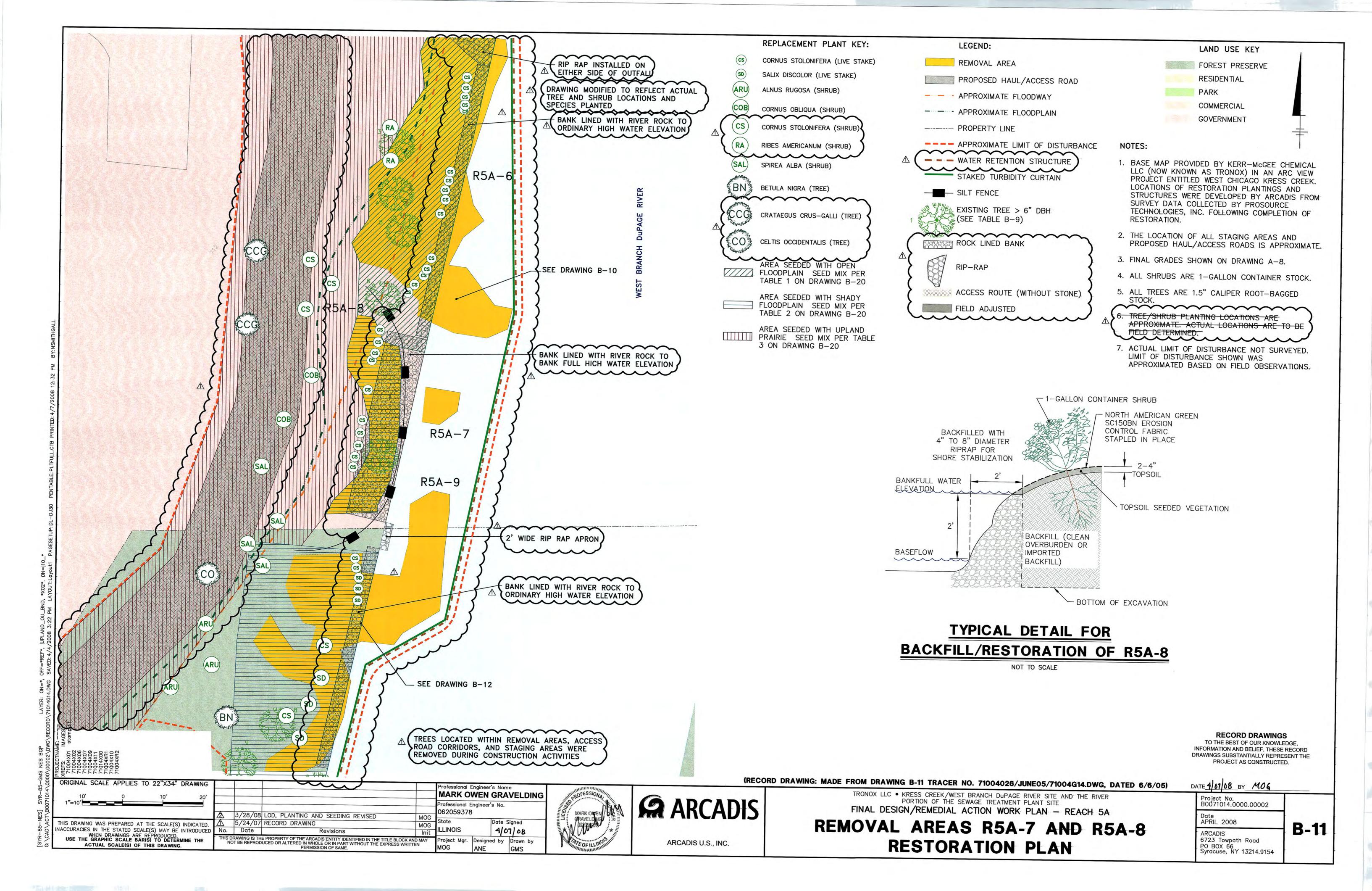


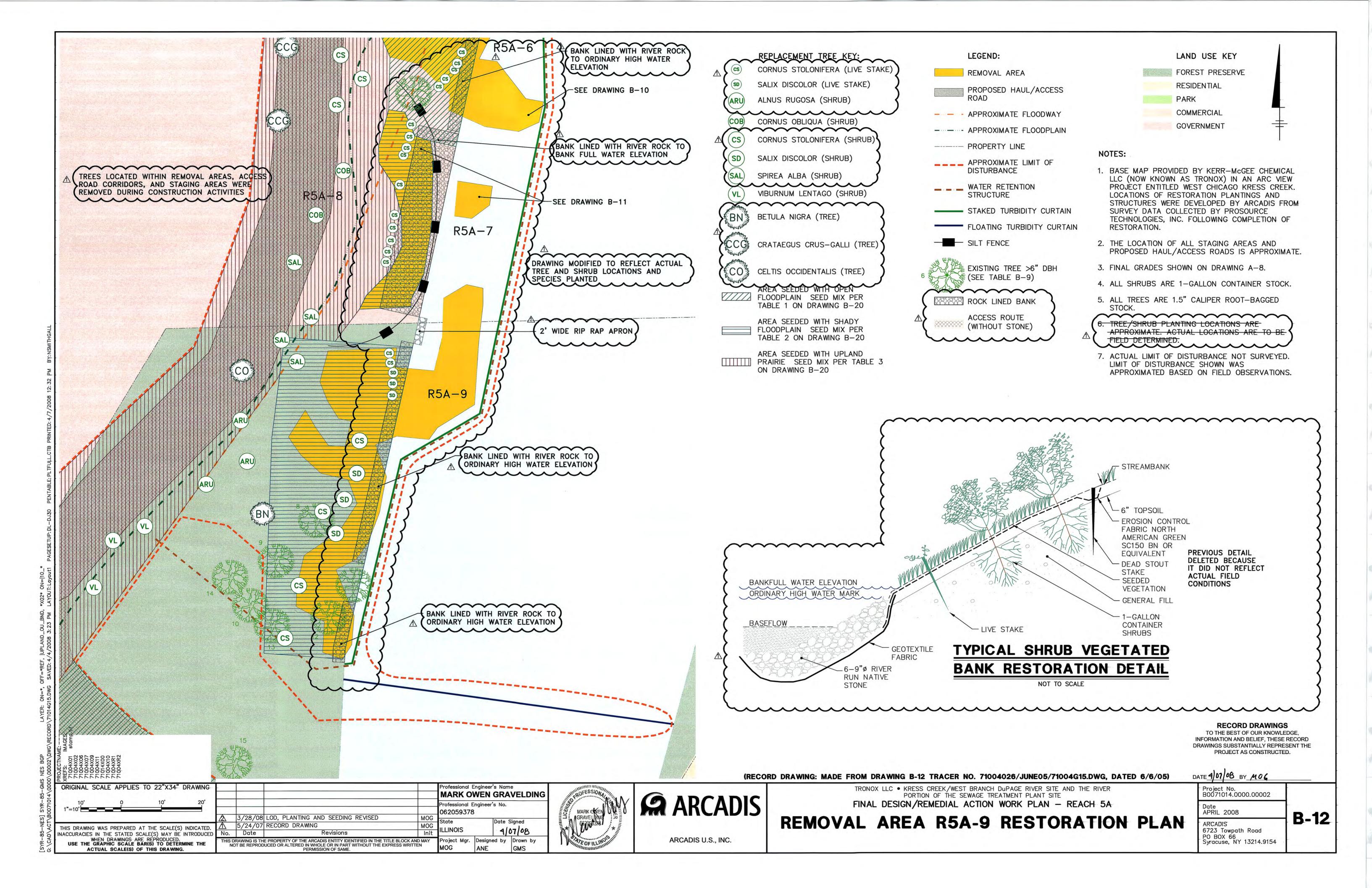
ARCADIS U.S., INC.

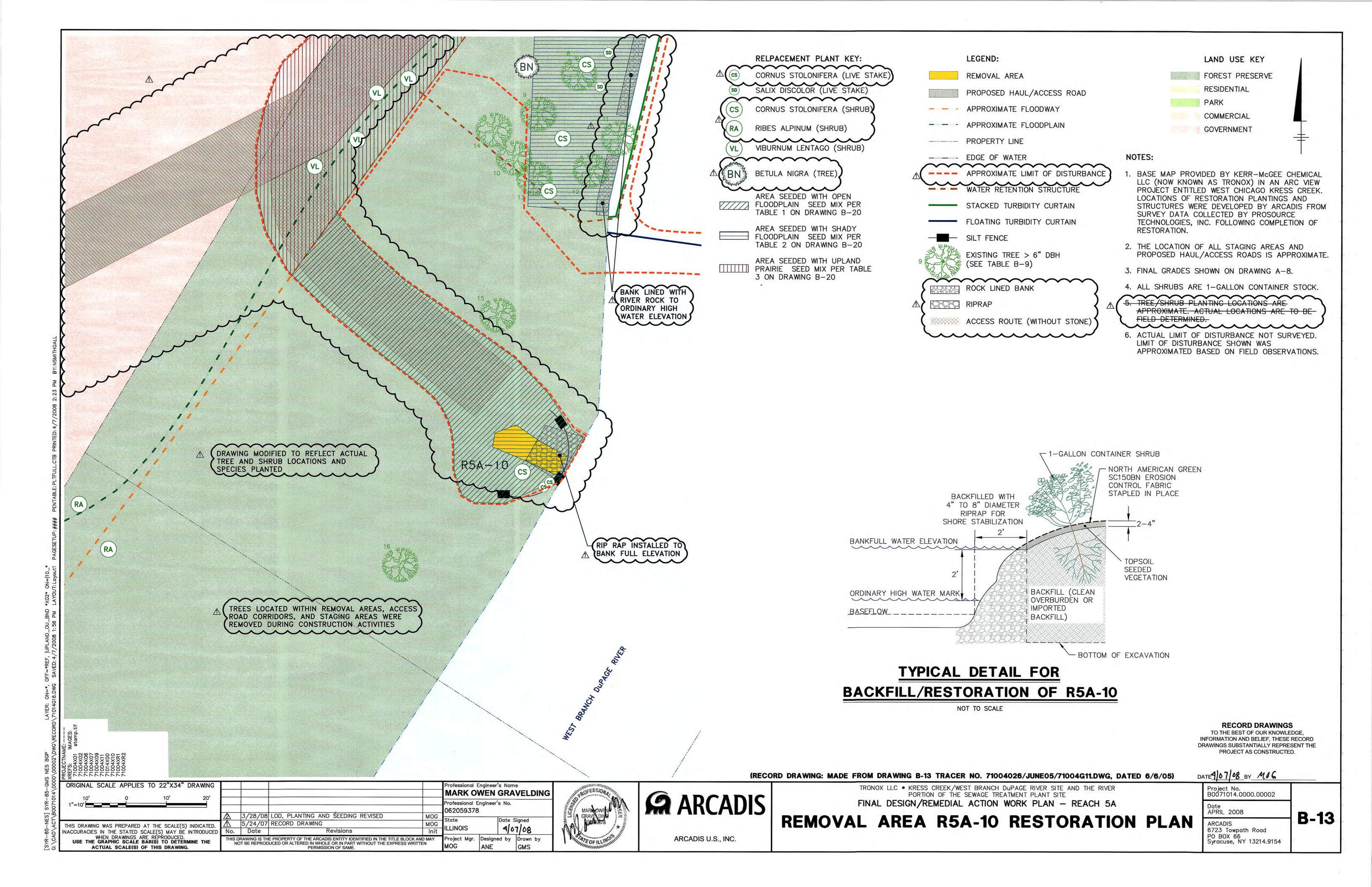


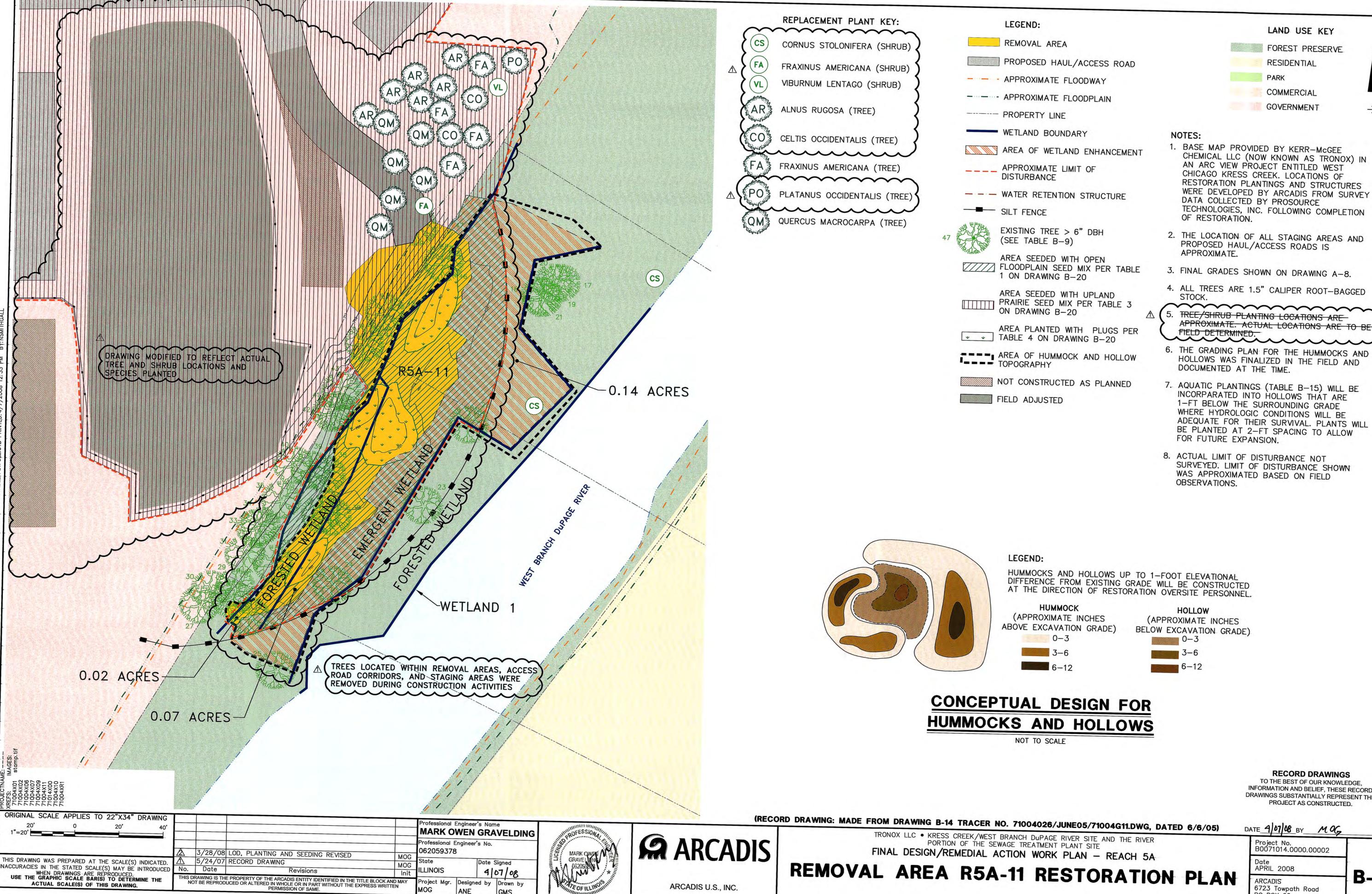












ARCADIS U.S., INC.

Project Mgr. Designed by Drawn by

ACTUAL SCALE(S) OF THIS DRAWING.

FOREST PRESERVE

LAND USE KEY

RESIDENTIAL

PARK COMMERCIAL

GOVERNMENT

5. TREE/SHRUB PLANTING LOCATIONS ARE APPROXIMATE. ACTUAL LOCATIONS ARE TO BE

6. THE GRADING PLAN FOR THE HUMMOCKS AND HOLLOWS WAS FINALIZED IN THE FIELD AND DOCUMENTED AT THE TIME.

7. AQUATIC PLANTINGS (TABLE B-15) WILL BE INCORPARATED INTO HOLLOWS THAT ARE 1-FT BELOW THE SURROUNDING GRADE WHERE HYDROLOGIC CONDITIONS WILL BE ADEQUATE FOR THEIR SURVIVAL. PLANTS WILL BE PLANTED AT 2-FT SPACING TO ALLOW FOR FUTURE EXPANSION.

8. ACTUAL LIMIT OF DISTURBANCE NOT SURVEYED. LIMIT OF DISTURBANCE SHOWN WAS APPROXIMATED BASED ON FIELD OBSERVATIONS.

DIFFERENCE FROM EXISTING GRADE WILL BE CONSTRUCTED AT THE DIRECTION OF RESTORATION OVERSITE PERSONNEL

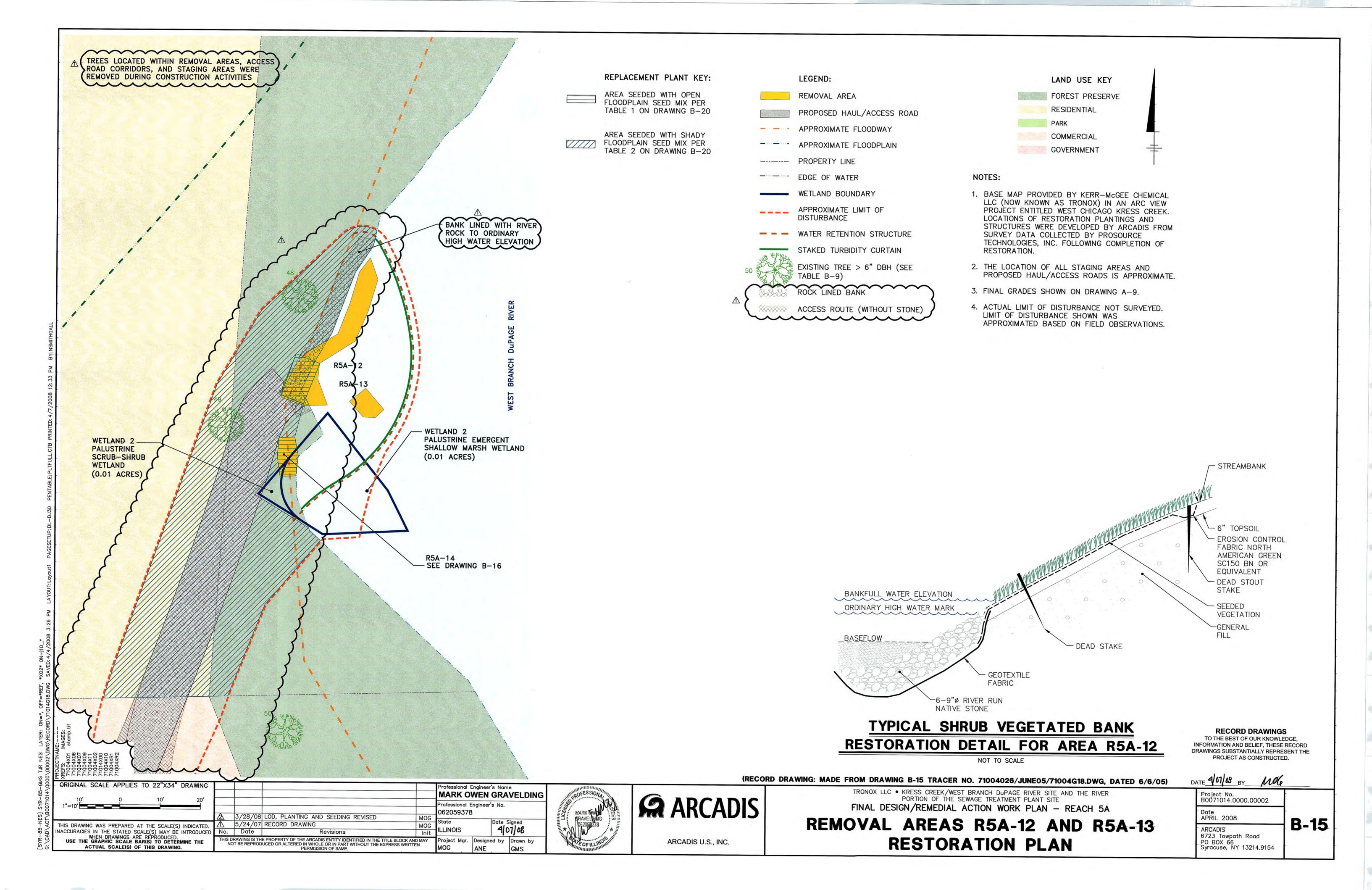
> HOLLOW (APPROXIMATE INCHES BELOW EXCAVATION GRADE) 0-3

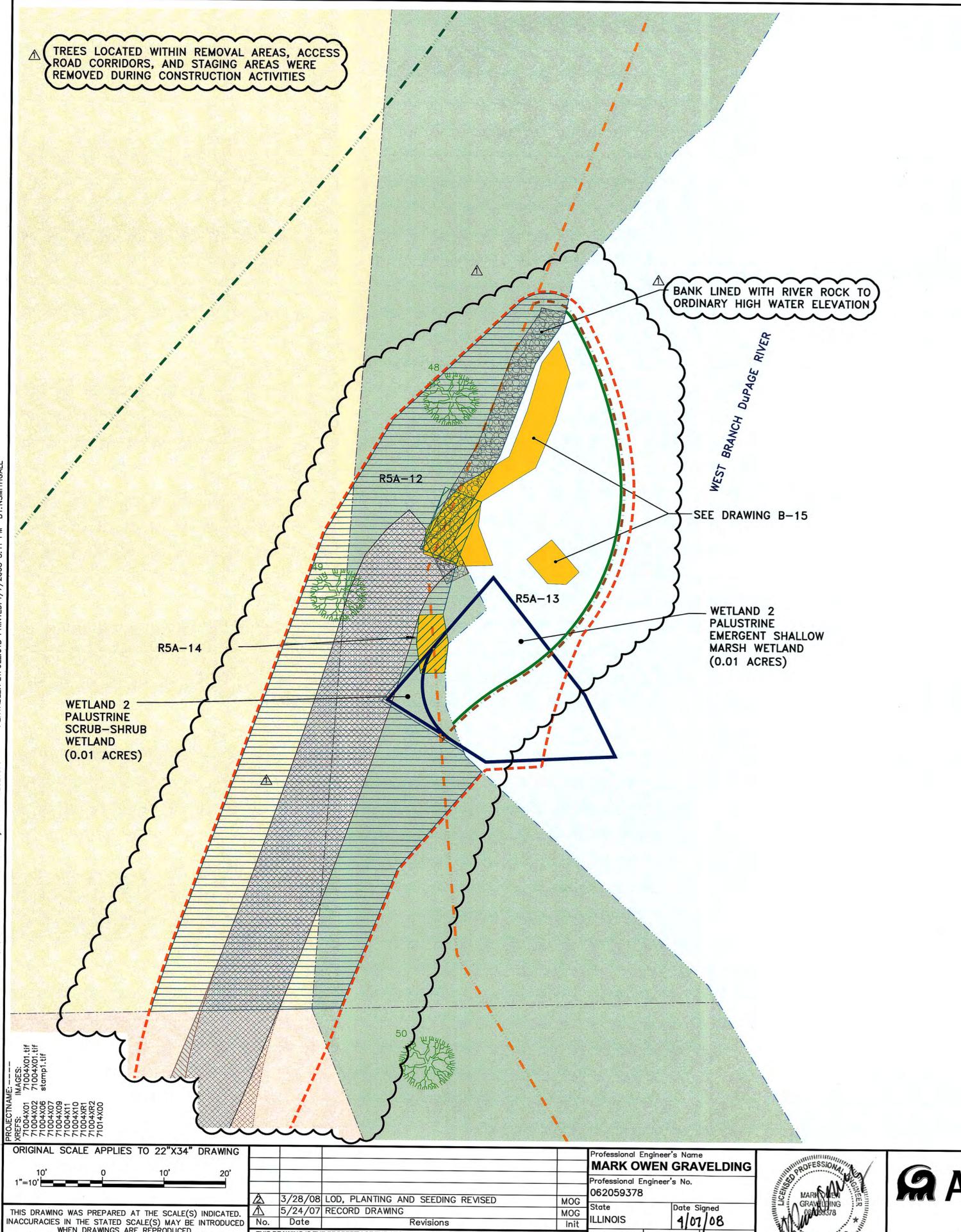
RECORD DRAWINGS TO THE BEST OF OUR KNOWLEDGE. INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

REMOVAL AREA R5A-11 RESTORATION PLAN

DATE 4/07/08 BY MOG Project No. B0071014.0000.00002

Date APRIL 2008 **B-14** ARCADIS 6723 Towpath Road PO BOX 66 Syracuse, NY 13214.9154





NACCURACIES IN THE STATED SCALE(S) MAY BE INTRODUCED

WHEN DRAWINGS ARE REPRODUCED.

USE THE GRAPHIC SCALE BAR(S) TO DETERMINE THE

ACTUAL SCALE(S) OF THIS DRAWING.

No. Date

HIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REPRODUCED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

LINOIS

Project Mgr. Designed by Drawn by

REPLACEMENT PLANT KEY:

AREA SEEDED WITH OPEN FLOODPLAIN SEED MIX PER TABLE 1 ON DRAWING B-20

> AREA SEEDED WITH SHADY FLOODPLAIN SEED MIX PER TABLE 2 ON DRAWING B-20

REMOVAL AREA MINOR ACCESS ROAD APPROXIMATE FLOODWAY

---- PROPERTY LINE

---- EDGE OF WATER

--- APPROXIMATE LIMIT OF DISTURBANCE

STAKED TURBIDITY CURTAIN

EXISTING TREE > 6" DBH (SEE TABLE

ACCESS ROUTE (WITHOUT STONE)

LEGEND:

---- APPROXIMATE FLOODPLAIN

WETLAND BOUNDARY

- - WATER RETENTION STRUCTURE

ROCK LINED BANK

FOREST PRESERVE RESIDENTIAL

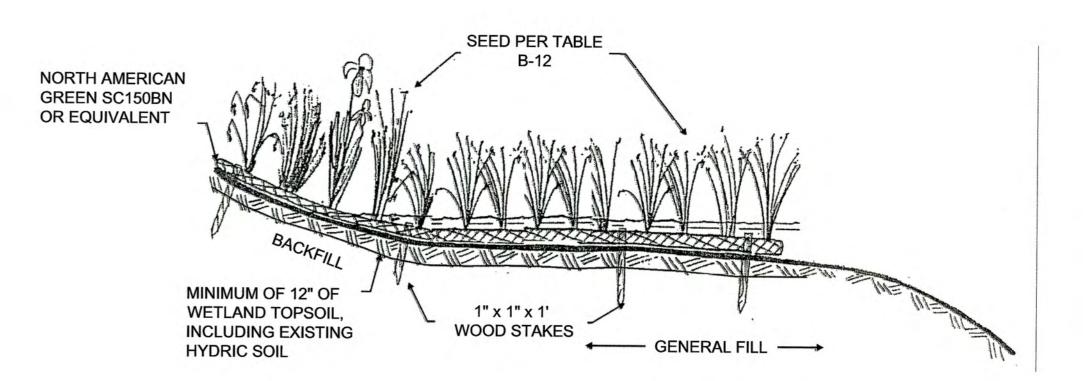
COMMERCIAL

GOVERNMENT

LAND USE KEY

NOTES:

- 1. BASE MAP PROVIDED BY KERR-McGEE CHEMICAL LLC (NOW KNOWN AS TRONOX) IN AN ARC VIEW PROJÈCT ENTITLED WEST CHICAGO KRESS CREEK. LOCATIONS OF RESTORATION PLANTINGS AND STRUCTURES WERE DEVELOPED BY ARCADIS FROM SURVEY DATA COLLECTED BY PROSOURCE TECHNOLOGIES, INC. FOLLOWING COMPLETION OF RESTORATION.
- 2. THE LOCATION OF ALL STAGING AREAS AND PROPOSED HAUL/ACCESS ROADS IS APPROXIMATE.
- 3. FINAL GRADES SHOWN ON DRAWING A-9.
- 4. ALL SHRUBS ARE 1-GALLON CONTAINER STOCK.
- 5. ACTUAL LIMIT OF DISTURBANCE NOT SURVEYED. LIMIT OF DISTURBANCE SHOWN WAS APPROXIMATED BASED ON FIELD OBSERVATIONS.



TYPICAL WETLAND BANK RESTORATION DETAIL

NOT TO SCALE

RECORD DRAWINGS TO THE BEST OF OUR KNOWLEDGE. INFORMATION AND BELIEF, THESE RECORD

DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

(RECORD DRAWING: MADE FROM DRAWING B-16 TRACER NO. 71004026/JUNE05/71004G19.DWG, DATED 6/6/05)

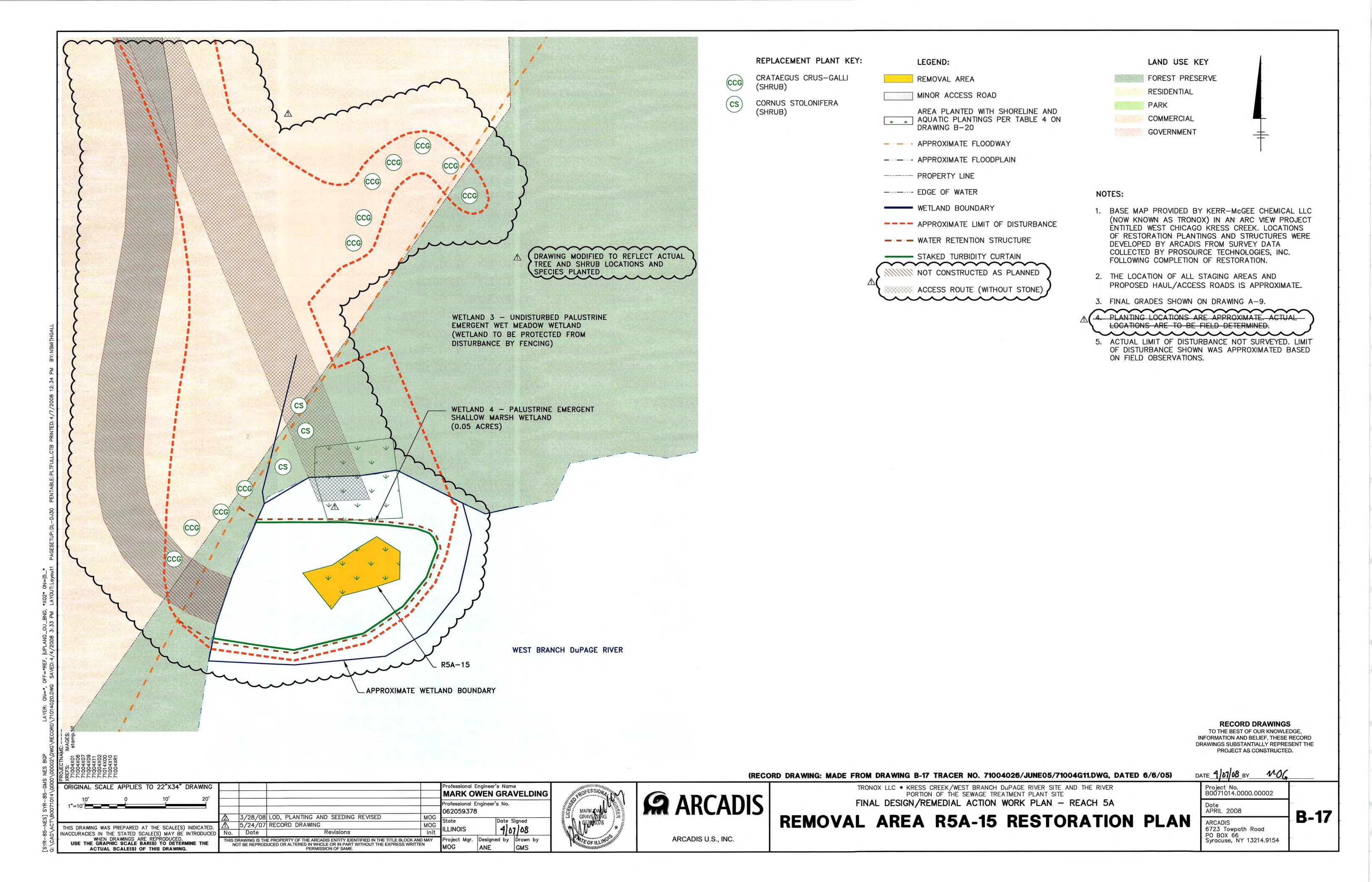
DATE 4 07/08 BY MOG TRONOX LLC • KRESS CREEK/WEST BRANCH DUPAGE RIVER SITE AND THE RIVER PORTION OF THE SEWAGE TREATMENT PLANT SITE FINAL DESIGN/REMEDIAL ACTION WORK PLAN - REACH 5A

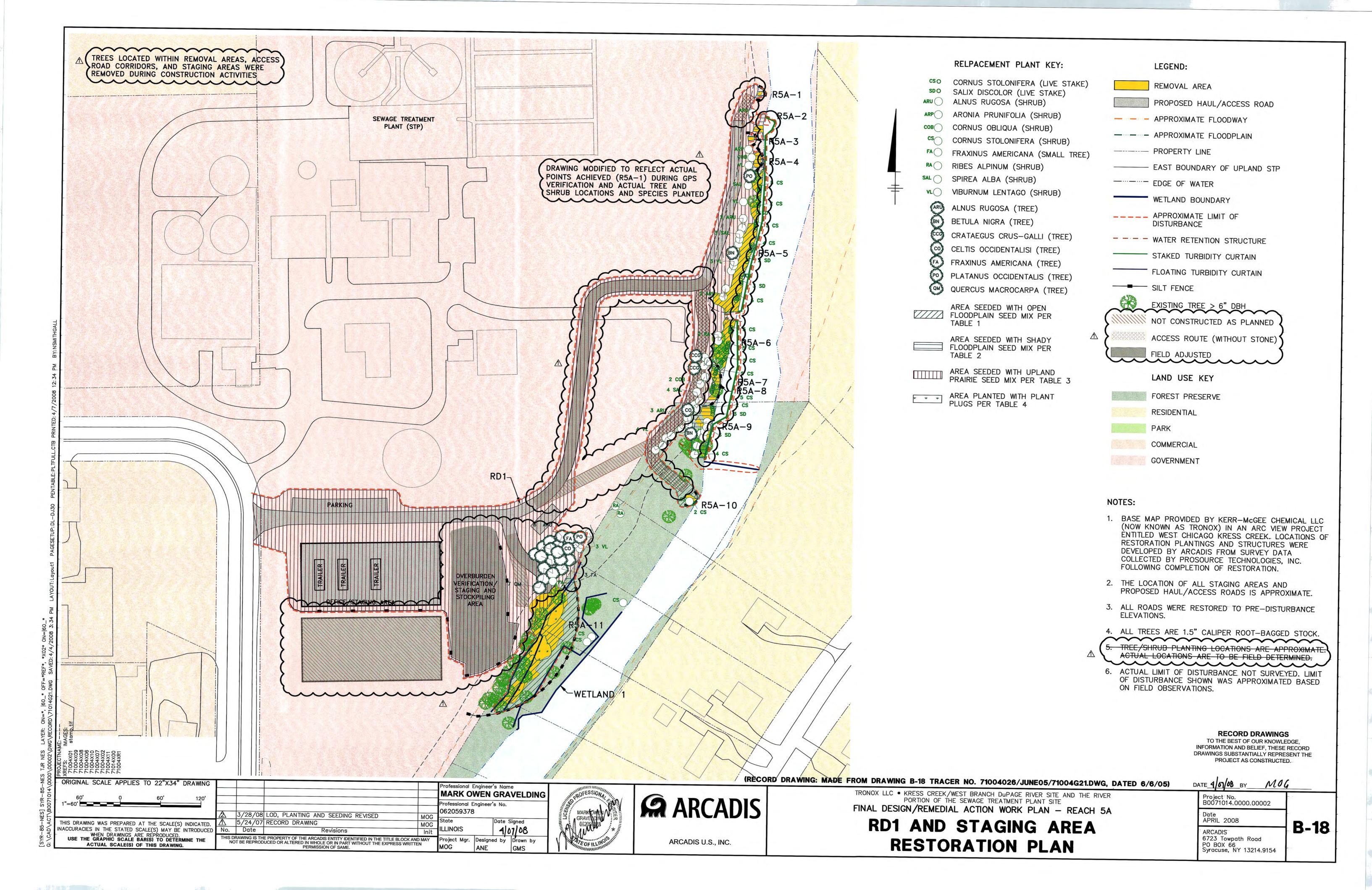
Project No. B0071014.0000.00002	
Date APRIL 2008	D 16
ARCADIS 6723 Towpath Road PO BOX 66 Syracuse, NY 13214.9154	B-16

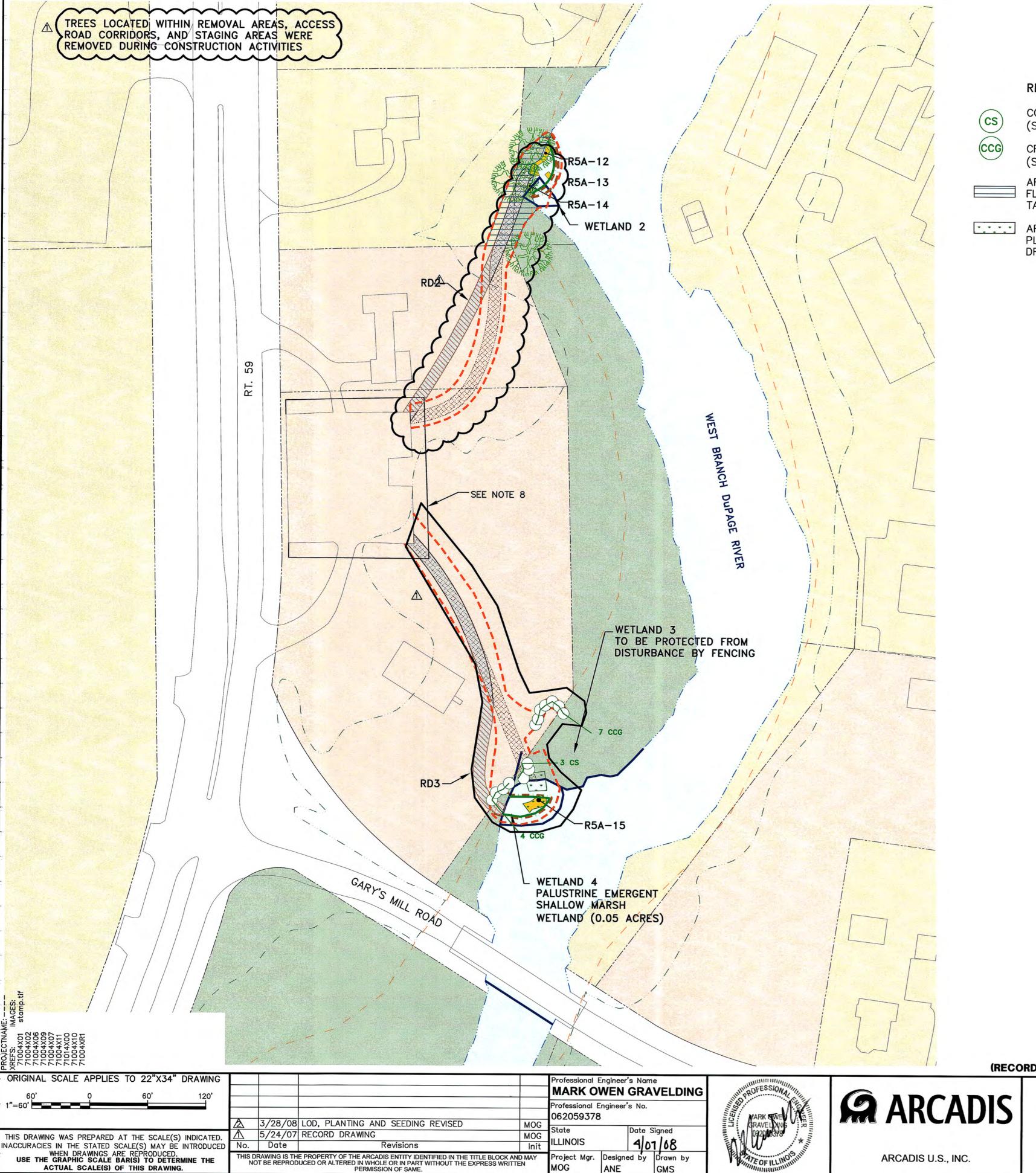
AARCADIS

ARCADIS U.S., INC.

REMOVAL AREA R5A-14 RESTORATION PLAN







ACTUAL SCALE(S) OF THIS DRAWING.

REPLACEMENT PLANT KEY:

CORNUS STOLONIFERA (SHRUB)

> CRATAEGUS CRUS-GALLI (SHRUB)

AREA SEEDED WITH SHADY FLOODPLAIN SEED MIX PER TABLE 2 ON DRAWING B-20

AREA PLANTED WITH PLANT PLUGS PER TABLE 4 ON DRAWING B-20

LEGEND:

REMOVAL AREA

PROPOSED MINOR ACCESS ROAD

PROPOSED ACCESS ROAD

----- APPROXIMATE FLOODPLAIN

---- PROPERTY LINE

-··-- EDGE OF WATER

----- WETLAND BOUNDARY

____ APPROXIMATE LIMIT OF DISTURBANCE

WATER RETENTION STRUCTURE

STAKED TURBIDITY CURTAIN

EXISTING TREE > 6" DBH

NOT CONSTRUCTED AS PLANNED ACCESS ROUTE (WITHOUT STONE)

COMMERCIAL APPROXIMATE FLOODWAY GOVERNMENT

NOTES:

1. BASE MAP PROVIDED BY KERR-McGEE CHEMICAL LLC (NOW KNOWN AS TRONOX) IN AN ARC VIEW PROJECT ENTITLED WEST CHICAGO KRESS CREEK. LOCATIONS OF RESTORATION PLANTINGS AND STRUCTURES WERE DEVELOPED BY ARCADIS FROM SURVEY DATA COLLECTED BY PROSOURCE TECHNOLOGIES, INC. FOLLOWING COMPLETION OF RESTORATION.

LAND USE KEY

FOREST PRESERVE

RESIDENTIAL

PARK

- 2. THE LOCATION OF ALL STAGING AREAS AND PROPOSED HAUL/ACCESS ROADS IS APPROXIMATE.
- 3. ALL ROADS WERE RESTORED TO PRE-DISTURBANCE ELEVATIONS. TREE/SHRUB PLANTING LOCATIONS ARE APPROXIMATE. ACTUAL LOCATIONS ARE TO BE FIELD DETERMINED.
- 5. NORTHERN BOUNDARY OF WETLAND 3 NOT DEFINED.
- 6. ACTUAL LIMIT OF DISTURBANCE NOT SURVEYED. LIMIT OF DISTURBANCE SHOWN WAS APPROXIMATED BASED ON FIELD OBSERVATIONS.

RECORD DRAWINGS INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

(RECORD DRAWING: MADE FROM DRAWING B-19 TRACER NO. 71004026/JUNE05/71004G11.DWG, DATED 6/6/05)

TRONOX LLC • KRESS CREEK/WEST BRANCH DuPAGE RIVER SITE AND THE RIVER PORTION OF THE SEWAGE TREATMENT PLANT SITE FINAL DESIGN/REMEDIAL ACTION WORK PLAN - REACH 5A

RD2 AND RD3 RESTORATION PLAN

Date APRIL 2008 ARCADIS 6723 Towpath Road

DATE 4 07 08 BY MOG

Project No. B0071014.0000.00002

B-19 PO BOX 66 Syracuse, NY 13214.9154

ARCADIS U.S., INC.

Species	Common Name	Lbs./Acre	
Andropogon gerardii	Big Bluestem	2.7	
Andropogon scoparius	Little Bluestem	2.75	
Aster novae-angliae	New England Aster	0.16	
Bidens cernua	Beggar Ticks	0.15	
Calamagrostis canadensis	Blue Joint Grass	2.7	
Carex vulpinoidea	Fox Sedge	0.14	
Echinacea pallida	Pale Purple Coneflower	1.3	
Elymus canadensis	Wild Rye	2.7	
Eupatorium maculatum	Spotted Joe Pye Weed	0.28	
Eupatorium perfoliatum	Boneset	0.28	
Glyceria striata	Fowl Manna Grass	3.2	
Panicum virgatum	Switchgrass	1.6	
Pycanthemum virginianum	Mountain Mint	0.17	
Rudbeckia hirta	Black-Eyed Susan	1.05	
Silphium laciniatum	Compass Plant	0.28	
Silphium terebinthinaceum	Prairie Dock	0.28	
Solidago rigida	Rigid Goldenrod	0.25	
Total		20	
Cover crop:	Annual Rye	3	

TABLE 2

Species	Common Name	Lbs./Acre	
Actinomeris alternifolia	Wingstem	0.62	
Aquilegia canadensis	Wild Columbine	0.62	
Aster lateriflorus	Calico Aster	0.62	
Aster shortii	Short's Aster	0.15	
Boehmeria cylindrica	False Nettle	0.125	
Bromus latiglumis	Vibrant Shade Grass	0.25	
Campanula americana	Tall Bellflower	0.06	
Carex blanda	Creek Sedge	0.062	
Cinna arundianacea	Stout Woodreed	0.5	
Diarrhena americana	Diarrhena	0.031	
Elymus riparius	River Bank Wild Rye	1	
Elymus villosus	Slender Wild Rye	0.768	
Elymus virginicus	Virginia Wild Rye	2	
Eupatorium rugosum	White Snakeroot	0.15	
Festuca obtuse	Fescue	0.15	
Glyceria striata	Fowl Manna Grass	0.5	
Impatiens capensis	Spotted Jewel-Weed	0.25	
Leersia oryzoides	Rice Cutgrass	0.25	
Penstemon digitalis	Foxglove Beard Tongue	0.15	
Phlox divaricata	Wood Phlox	0.15	
Polygonatum canaliculatum	Solomon's Seal	0.15	
Pycnanthemum virginianum	Mountain Mint	0.15	
Rudbeckia laciniata	Tall Coneflower	0.44	
Solidago flexicaulis	Broadleaf Goldenrod	0.031	
Solidago gigantean	Giant Goldenrod	0.031	
Solidago ulmifolia	Elm-leaved Goldenrod	0.125	
Veronicastrum virginicum	Culver's Root	0.31	
Zizia aurea	Golden Alexanders	0.062	
Total		9.705	
Cover Crop:	Annual Rye	4	

TABLE 3

Upland P	rairie Seed Mix	
Species	Common Name	Lbs./Acre
Allium cernuum	Nodding Wild Onion	1
Aster novae-angliae	New England Aster	0.25
Baptisia leucantha	White Wild Indigo	0.25
Bouteloua curtipendula	Side-Oats Grama	10
Cassia fasciculata	Partridge Pea	1
Desmodium canadense	Showy Tick Trefoil	0.5
Echinacea palliada	Pale Purple Coneflower	1
Echinacea purpurea	Purple Coneflower	1
Heliopsis helianthoides	Ox-Eye	0.5
Liatris aspera	Button Blazing Star	1
Liatris pycnostachya	Prairie Blazing Star	1
Monarda fistulosa	Wild Bergamot	0.5
Penstemon digitalis	Foxglove Beard Tongue	0.5
Ratibida pinnata	Yellow Coneflower	1
Rudbeckia hirta	Black-Eyed Susan	1
Schizachyrium scoparium	Little Bluestem	10
Silphium integrifolium	Rosinweed	0.25
Silphium laciniatum	Compass Plant	0.25
Silphium terebinthinaceum	Prairie Dock	0.25
Solidago rigida	Rigid Goldenrod	0.5
Zizia aurea	Golden Alexanders	1
Total		32.75
Cover Crop:	Annual Rye	3

TABLE 4

Shorel	ine and Aquatic Pla	ntings		
Species	Common Name	Number Planted		
179	1	Wetland 1	Wetland 4	
Nuphar advena	Spatterdock	76	5	
Nymphaea tuberosa	White water lily	76	3	
Potamogeton nodosus	Long-Leaved Pondweed	76	4	
Sagittaria latifolia	Arrowhead	76	4	
Total		304	16	

TABLE 5

Lawn Seed Mix					
Common Name	Percent				
Perennial Ryegrass	34.1				
Annual Ryegrass	24.85				
Kentucky Bluegrass	19.48				
Creeping Red Fescue	19.48				
Other Crop Seed	0.26				
Inert Matter	2.09				
Weed Seed	0.24				
Total	100.5				

RECORD DRAWINGS

TO THE BEST OF OUR KNOWLEDGE,
INFORMATION AND BELIEF, THESE RECORD
DRAWINGS SUBSTANTIALLY REPRESENT THE
PROJECT AS CONSTRUCTED.

DATE 4 07 08 BY MOG Project No. B0071014.0000.00002

Professional Engineer's Name

MARK OWEN GRAVELDING ORIGINAL SCALE APPLIES TO 22"X34" DRAWING Professional Engineer's No. NOT TO SCALE 062059378 State Date Signed

ILLINOIS 401/08

Project Mgr. Designed by Drawn by ↑ 3/28/08 RECORD DRAWING MOG Init THIS DRAWING WAS PREPARED AT THE SCALE(S) INDICATED.
INACCURACIES IN THE STATED SCALE(S) MAY BE INTRODUCED
WHEN DRAWINGS ARE REPRODUCED.
USE THE GRAPHIC SCALE BAR(S) TO DETERMINE THE
ACTUAL SCALE(S) OF THIS DRAWING.

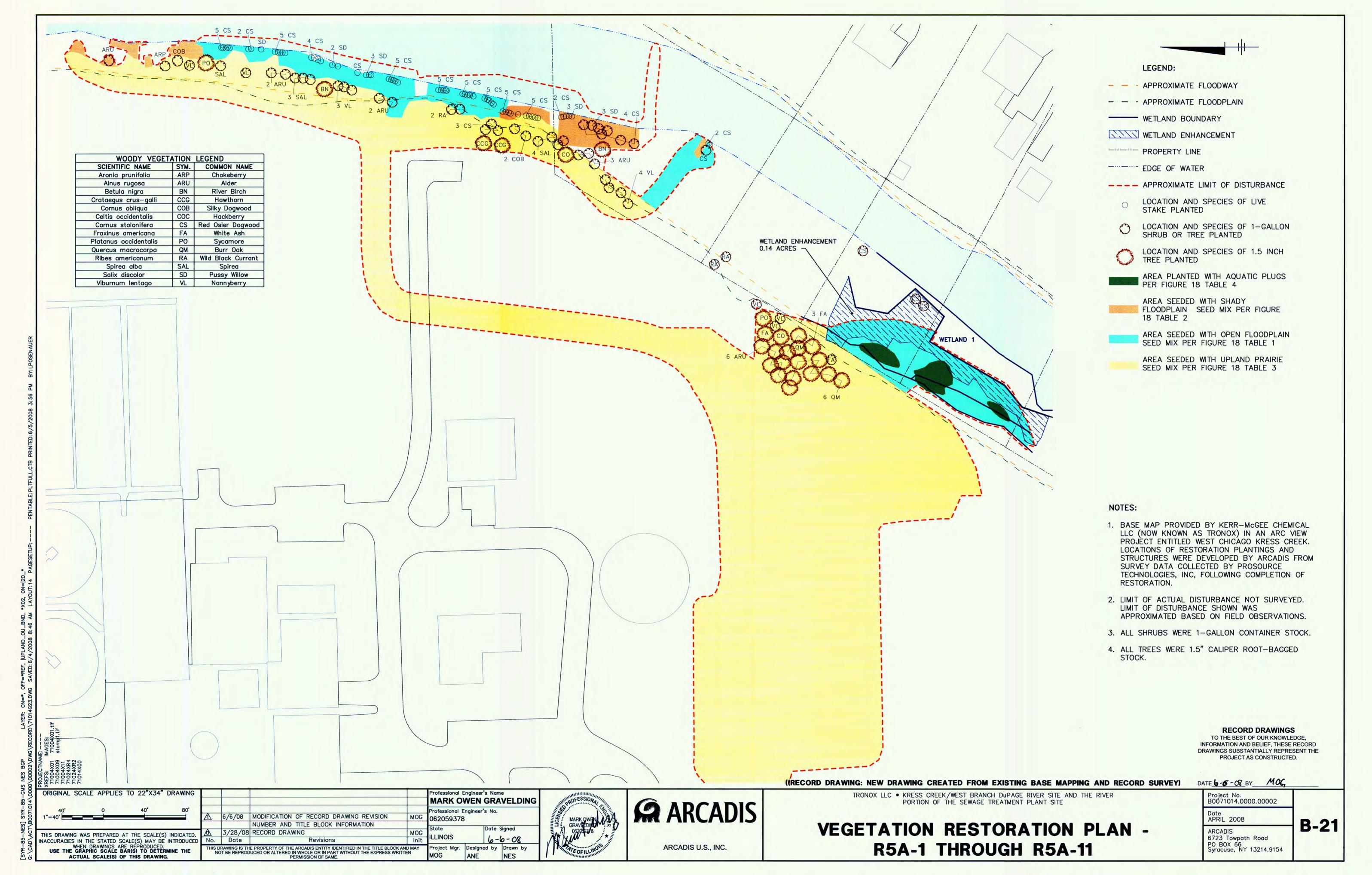
3/28/08
No. Date
THIS DRAWING IS THE
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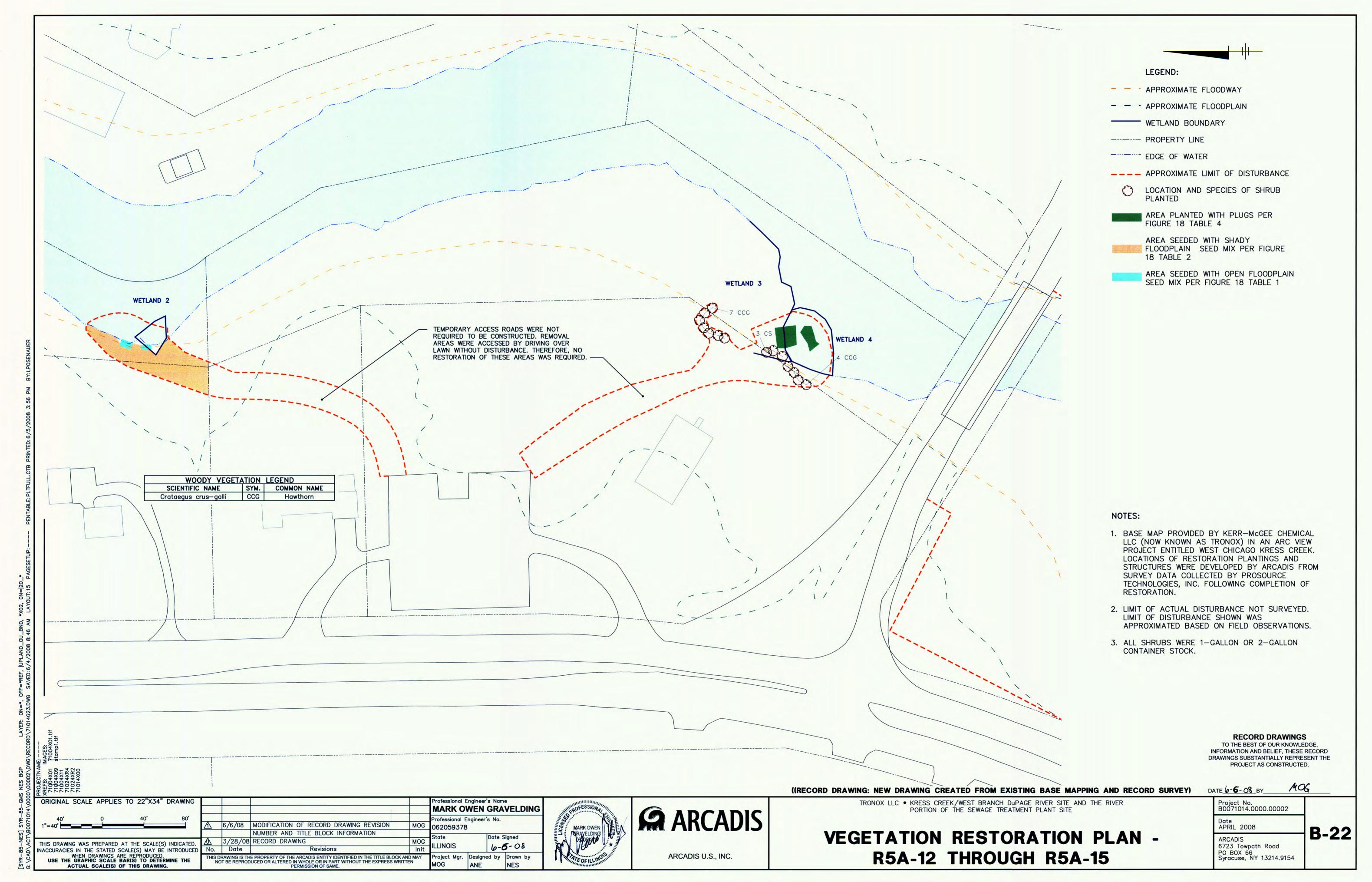




TRONOX LLC • KRESS CREEK/WEST BRANCH Dupage RIVER SITE AND THE RIVER PORTION OF THE SEWAGE TREATMENT PLANT SITE

SEED MIXES - REACH 5A





ARCADIS BBL

Appendix I

Representative Project Photographs

Site Name: Remedial Action For Reach 5A Project Number: B0071014.0000, 00002

Site Location: West Chicago, Illinois

Photographer: Michael Savage ARCADIS BBLES

Date: July 18, 2005

Direction: Looking Southeast

Comments:

Two rows of silt fencing in West Branch at discharge area of dewatering system, north of R5A-2.



Photographer: Michael Savage ARCADIS BBLES

Date: July 18, 2005

Direction: Looking East

Comments:

Floating turbidity curtain downstream of remedial construction activity and south of R5A-9.



Site Name: Remedial Action For Reach 5A Project Number: B0071014.0000, 00002

Site Location: West Chicago, Illinois

Photographer: Michael Savage ARCADIS BBLES

Date: July 18, 2005

Direction: Looking East

Comments:

Water retention structure, made of super sacks of sand and wrapped with reinforced polyethylene, encompassing R5A-2 down through R5A-5.



Photographer: Michael Savage ARCADIS BBLES

Date: July 18, 2005

Direction: Looking South

Comments:

Looking south (downstream) along exterior edge of water retention structure, near R5A-2.



Site Name: Remedial Action For Reach 5A Project Number: B0071014.0000, 00002

Site Location: West Chicago, Illinois

Photographer: Michael Savage ARCADIS BBLES

Date: July 18, 2005

Direction: Looking South

Comments:

Looking at dewatered west bank, with interior staked turbidity curtains, in area of R5A-5.



Photographer: Michael Savage ARCADIS BBLES

Date: July 18, 2005

Direction: Looking North

Comments:

Looking at dewatered west bank in the area of R5A-5, with staked turbidity curtains.



Site Name: Remedial Action For Reach 5A Project Number: B0071014.0000, 00002

Site Location: West Chicago, Illinois

Photographer: Michael Savage ARCADIS BBLES

Date: July 18, 2005

Direction: Looking Southeast

Comments:

Excavation of overburden and targeted material within water retention structure in area R5A-5. Dust control measures being applied.



Photographer: Michael Savage ARCADIS BBLES

Date: August 6, 2005

Direction: Looking North

Comments:

Performing the grading of the hummock and hollow area in R5A-11.



Site Name: Remedial Action For Reach 5A Project Number: B0071014.0000, 00002

Site Location: West Chicago, Illinois

Photographer: Michael Savage ARCADIS BBLES

Date: August 6, 2005

Direction: Looking North

Comments:

Performing the grading of the hummock and hollow area in R5A-11.



Photographer: Michael Savage ARCADIS BBLES

Date:

August 24, 2005

Direction: Looking South

Comments:

River rock armoring of restored west bank in R5A-2.





Appendix J

Water Column Monitoring Data Summary for Reach 5A

Appendix J
Water Column Monitoring Data for 2005 Reach 5A

Final Completion Report - Reach 5A for the Kress/Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site Tronox LLC - DuPage County, Illinois

		Turbidity	Turbidity Downstream	Downstream -
Date	Reach	Upstream (NTU)	(NTU)	U∕Stream NTU
7/15/05	5A	8.2	10.9	2.7
7/18/05	5A	7.8	14.1	6.3
7/19/05	5A	0.7	7.3	6.6
7/20/05	5A	221	14.7	-206.3
7/21/05	5A	18.1	30.6	12.5
7/22/05	5A	3.2	12.6	9.4
7/23/05	5A	15.4	21.4	6
7/25/05	5A	0.6	10.6	10
7/26/05	5A	11.2	4.6	-6.6
7/27/05	5A	38.2	23.9	-14.3
7/28/05	5A	11.9	20.2	8.3
8/1/05	5A	0	33.2	33.2
8/2/05	5A	11.3	41.6	30.3
8/3/05	5A	1.3	15.6	14.3



Appendix K

Sampling Data for Reusable Overburden for Reach 5A

ENVIRONMENTAL SERVICES, INC.

Remedial Action • Management and Construction

Transmittal

		KC 044				
Transmitted via	Hand Delivery	BBL Environmental Services, Inc. 800 Weyrauch St., West Chicago, IL 60185 Field Office No. :(630) 293-7695				
To: Mark Kri		Date: August 15, 2005				
Kerr-McGee Chemical LLC 800 Weyrauch Street West Chicago, IL 60185		LC File: 71014.002 Kress Creek Remedial Action, Reach 5A West Chicago, IL	4			
We are sending If material receiv	draw					
Quantity	Identifying Numbers #	Title				
Reach 5A		Reach 5A - Overburden Lift Sample Results				
1	Pile # OB-1- R5A (5)	(C-R5A-071205-OB-1A through 1F (approved 07/25/05)				
1	Pile # OB-2- R5A (5)	KC-R5A-071505-OB-2A through 2F (approved 07/25/05)	l			
1	Pile # OB-1- R5A (6)	KC-R5a-072005-OB-1A through 1F (approved 07/25/05)	I			
2	08/15/05	Overburden Piles Tracking Spreadsheet for 2005 (dated 8/15/05)	1			
Action letter cod	le: R - revie S - resul	i ioi jour illioimation				
*Action letter cod		i ioi your information				

Michael F. Savage Michael F. Savage, P.E. Senior Engineer II

MFS/mfs **Enclosures** CC:

Mark Gravelding, BBLES Mark Schmitt, Sevenson

OVERBURDEN PILE SAMPLING

Excavation Area:	Kress Creek (KC) Reach 5 A							
Date Sampled:	7/12/2005				Number of Samples Required Per SOP 214			
PILE #: OB-1- R5A (5)	Est. Volume of Pile in Cubic Yards:	175			6			
					S ₂	S _{dup}		
Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	Std. Dev. for the analyses of the duplicate sample	Std. Dev. of the duplicate sampling & measurement		
KC-R5A-071205-OB-1A	3.6						-	
KC-R5A-071205-OB-1B	3.3							
KC-R5A-071205-OB-1C	2.9							
KC-R5A-071205-OB-1D	2.6							
KC-R5A-071205-OB-1E	3.6			1				
KC-R5A-071205-OB-1F	3.8							
KC-R5-071205-OB-1QC	L-LUMBER -	2.8	0.2	0.1	0.2			
Number of Samples (n)	6				$S_{dup} = sqrt (S_1^2 + S_2^2) =$	0.45		
Average (Mean of the sample population) (X bar)	3.3				i	<u> </u>	J	
Average of samples is <7.2 pCi/g, Proceed with SOP-214, Paragra							ard Deviations (3 S _{dup}) of the P 214, paragraph 12.1	e mean of
Standard Deviation of sample population (S ₁)	0.4	"t" value			3 x S _{dup} =	1.35		
U_{α} (True Mean) = (X bar) + (t * (S ₁ /sqrt(n)))	3.7	2,015			Mean + 3 S _{dup} =	4.7	QC < (Mean + 3S _{dup})?	о.к.
Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	•				Mean - 3 S _{dup} =	2.0	QC > (Mean - 3S _{dup})?	о.к.
Release Criteria	7.2							
U _α < Release Criteria?	SAMPLES TESTED MEET 95% CONFI LIFT IS RADIOLOGICALLY ACCEPT, AS ONSITE BACKFILL PER S	ABLE FOR USE						
REVIEWED: BBLES/SES MF SONOLI	105 Jeff Walkerth.	h Sity	<u>)1/22/05</u>	5				
APPROVED: OFFSITES MANAGER:	miles	Name/date 7-2(5-0)						
		Name/date						

OVERBURDEN PILE SAMPLING

Excavation Area: Kress Creek (KC) Reach 5 A 7/15/2005 Number of Samples Date Sampled: Required Per SOP 214: PILE #: OB-2- R5A (5) Est. Volume of Pile in Cubic Yards: S2 S_{dup} QC Sample Dup. 2 sigma 2 sigma Std. Dev. for the Std. Dev. of the Total Radium in pCi/g Tot. Rad. in pCi/g uncertainty uncertainty analyses of the duplicate sampling & Sample # (Th 232 + Ra 226) (Th 232 + Ra 226) (Ra 226) duplicate sample measurement (Th 232) KC-R5A-071505-OB-2A 0.8 KC-R5A-071505-OB-2B 3.9 KC-R5A-071505-OB-2C 3.4 KC-R5A-071505-OB-2D 3.1 KC-R5A-071505-OB-2E 3.0 KC-R5A-071505-OB-2F 3.2 0.1 0.2 KC-R5-071505-OB-2QC $S_{dup} = sqrt (S_1^2 + S_2^2) =$ 1.00 6 Number of Samples (n) Average (Mean of the sample population) (X bar) 2,9

Average of samples is <7.2 pCi/g, Proceed with SOP-214, Paragra		n
Standard Deviation of sample population (S ₁)	1.0	
U _α (True Mean) = (X bar) + (t * (S ₁ /sqrt(n))) Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	3.7	"t" value 2.015
Release Criteria	7.2	
	SAMPLES TESTED MEET 95% CC	NFIDENCE LEVEL -

Check if QC Sample Dup. is within 3 Standard Deviations (3 Sdup) of the mean of the sample population, per SOP 214, paragraph 12.1 3 x S_{dup} = 3.01 Mean + 3 S_{dup} = QC < (Mean + 3S_{dup})? 0.K. 5.9 Mean - 3 S_{dup} = -0.1 QC > (Mean - 3S_{dup})? 0.K.

U_α < Release Criteria?

APPROVED: OFFSITES MANAGER:

20505 1/23/05 2-2505 Name/date

LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE

AS ONSITE BACKFILL PER SOP-214

Name/date

OVERBURDEN PILE SAMPLING

Excavation Area:	Kress Creek (KC) Reach 5 A							
Date Sampled:	7/20/2005 Est. Volume of Pile in Cubic Yards:	146			Number of Samples Required Per SOP 214 6	:		
PILE #: OB-1- R5A (6)	EST. VOLUME OF FRE III CUDIC TARGE.	140					7	
					S ₂	S_{dup}		
Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	Std. Dev. for the analyses of the duplicate sample	Std. Dev. of the duplicate sampling & measurement		
KC-R5A-072005-OB-1A	5.1							
KC-R5A-072005-OB-1B	4.1							
KC-R5A-072005-OB-1C	5.3			}				
KC-R5A-072005-OB-1D	3.9 4.9							
KC-R5A-072005-OB-1E KC-R5A-072005-OB-1F	4.9							
RC-RSA-072003-CB-11								
			<u> </u>	0,1	0.2			
KC-R5-072005-OB-1QC		5.9	0.4				-	
Number of Samples (n)	6				$S_{dup} = sqrt (S_1^2 + S_2^2) =$	0.61		
Average (Mean of the sample population) (X bar)	4.5				l	L		
Average (wear) of the sample population (X but)								
Average of samples is <7.2 pCi/g, Proceed with SOP-214, Paragra	Confidence Level Check described in aph 6.12						ard Deviations (3 S _{dup}) of th DP 214, paragraph 12.1	ne mean o
Standard Deviation of sample population (S ₁)	0.6	NAH			3 x S _{dup} =	1.83		
		"t" value 2.015			Mean + 3 S _{dup} =	6.4	QC < (Mean + 3S _{dup})?	o.K.
U _{α} (True Mean) = (X bar) + (t * (S ₁ /sqrt(n))) Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	5.0	2.010			Mean - 3 S _{dup} =		QC > (Mean - 3S _{dup})?	O.K.
Release Criteria	7.2							
U _α < Release Criteria?	SAMPLES TESTED MEET 95% CONF LIFT IS RADIOLOGICALLY ACCEPT AS ONSITE BACKFILL PER	ABLE FOR USE						
REVIEWED: BBLES/SES M.F. Saval	105 Jeff Walky Kill	Name Thate	8 7/2	3/05				
APPROVED: OFFSITES MANAGER:	m	Name date	2 7-2	508				
		Name/date						

				V N	S Ob-wi111 G						
	Kerr-McGee Chemical LLC Remedial Action at the Kress Creek Project, West Chicago, IL										
	·		Overt	ourden Piles Tr	acking Spreadsh	eet for 2005					
	Prepared By: BBLES on 08/15/2005										
	Τ			Ргерагео ву:	BBLES ON 06/15	2005			I		
					Date						
		Overburden Pile		Volume of	Resampled (if	Date Statistical	Date(s) When	Area(s) Used			
Reach No.	Section No.	Sample No.	Date Sampled	Pile (cys.)	applicable)	Analysis Complete	Backfilled	for Backfill	Comments		
								554 4 5 4 4 5	10 cys. had elevated scans and		
5A 5A	R5A-3, 4 & 11 R5A- 8 & 11	OB-1 OB-2	11/3/2004 11/9/2004	186 371	N/A N/A	11/5/2004 11/10/2004	11/ 9&11 /04 11/15/2004	R5A-1,3,4,10 R5A-8	was sent to REF as byproduct.		
5A 5A	R5A-11	OB-2	11/10/2004	84	N/A	11/12/2004	12/ 01&02 /04	R5A-11	-		
	1,01111		11/10/2001			1,7,122001					
5A	R5A-5	OB-1	7/12/2005			7/25/2005					
5A	R5A-5	OB-2	7/15/2005	175	N/A	7/25/2005	08/ 08&09 /05	R5A-5			
5A	R5A-6	OB-1	7/20/2005	146	N/A	7/25/2005	08/ 01 - 05 /05	R5A-6			
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		* Monthly totals avoid	mod on the detail	the Statistical *-	obsis of the accept	ourden pile was comple	ated				
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ENVIRONMENTAL SERVICES, INC.

Remedial Action • Management and Construction

Transmittal

KC 015

Tre	ansmitted via l	Hand Delivery		725 Day	vironmental Services, Inc ton Ave., Gate #2, West fice No. :(630) 293-1932		185
То	Kerr-McC 800 Weyi	ppel Jee Chemical LI rauch Street cago, IL 60185	C	Date: File:	November 15, 2004 71012 Kress Creek Remedial A West Chicago, IL	Action	
We	e are sending y	you: ⊠ herev ⊡ drawi		under letters	separate cover other_	: -	
lf n	naterial receive	ed is not as liste	d, please notify u	s at once			
	Quantity	Identifying Numbers #		- 14 - 2 - 4 - 1 - 14 - 14 - 14 - 14 - 1	Title		Action*
	Reach 5A		Reach 5A - O	verburd	en Lift Sample Result	s	
	1	Pile # OB-3	KC-R5A-111004	I-OB-3A	hrough 3E (approved 11	/12/04)	I .
	2	11/15/04	Overburden Pile	es Trackir	g Spreadsheet for 2004		1
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Sin BB Mic Sei	cerely, L ENVIRONM MMAAA chael F. Savaq nior Engineer			-			
MF	S/mfs	1		CC	: Mark Gravelding, E	SRLE2	

Mark Schmitt, Sevenson

Enclosures

Kress Creek Samples

Date Samples Recieved:

11/11/2004

Overburden

Dry Weight Corrected

Sample Location	U-238 in pCi/g	+ / - in pCi/g	Th-232 in pCi/g	+ / - in pCi/g	Ra-226 in pCi/g	+ / - in pCi/g	Total Uranium in pCi/g	Total Radium in pCi/g
KC-R5A-111004-OB-3A	0.9	0.5	1.3	0.2	0.6	0.1	1.7	1.9
KC-R5A-111004-OB-3B	< 1.1	N/A	1.3	0.2	0.6	0.1	< 2.2	1.9
KC-R5A-111004-OB-3C	1.2	0.7	1.2	0.2	0.7	0.1	2.5	1.9
KC-R5A-111004-OB-3D	< 0.9	N/A	1.0	0.2	0.6	0.1	< 1.8	1.6
KC-R5A-111004-OB-3E	< 0.7	N/A	1.4	0.2	0.6	0.1	< 1.5	2.0
KC-R5A-111004-OB-3QC	1.2	0.7	1.2	0.2	0.6	0.1	2.4	1.8

all samples counted in the marinelli geometry for 30 minutes

Reviewed

Rv

11/11/2004

OVERBURDEN PILE SAMPLING

Excavation Area:	Kress Creek (KC) Reach 5 A							
Date Sampled:	11/10/04				Number of Samples			
PILE #: OB-3- R5A (11)	Est. Volume of Pile in Cubic Yards:	84			Required Per SOP 214 5	! :		
					S ₂	S _{dup}		
Sample#	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	Std. Dev. for the analyses of the duplicate sample	Std. Dev. of the duplicate sampling & measurement		
KC-R5A-111004-OB-3A	1.9				_	***************************************	_	
KC-R5A-111004-OB-3B	1.9							
KC-R5A-111004-OB-3C	1.9		1			-		
KC-R5A-111004-OB-3D	1.6							
KC-R5A-111004-OB-3E	2.0			į				
KC-R5-111004-OB-3QC	1	1.8	0.2	0.1	0.2			
Number of Samples (n)	5			:	$S_{dup} = sqrt(S_1^2 + S_2^2) =$	0.20		
Average (Mean of the sample population) (X bar)	1.9						1	
Average of samples is <7.2 pCi/g, Proceed with SOP-214, Paragra					1		lard Deviations (3 S _{dup}) of OP 214, paragraph 12.1	the mean
Standard Deviation of sample population (S ₁)	0.1				3 x S _{dup} =	0.61		
U _α (True Mean) = (X bar) + (t * (S ₁ /sqrt(n))) Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	2.0	"t" value 2.132			Mean + 3 S _{dup} = Mean - 3 S _{dup} =		QC < (Mean + $3S_{dup}$)? QC > (Mean - $3S_{dup}$)?	0.K. 0.K.
Release Criteria	7.2							
U _∆ < Release Criteria?	SAMPLES TESTED MEET 95% CONF LIFT IS RADIOLOGICALLY ACCEPT. AS ONSITE BACKFILL PER S	ABLE FOR USE						
REVIEWED: BBLES/SES	NF Savage 11-11-04 Jeffer Lellia	Name/date	>11-1100	y				
APPROVED: OFFSITES MANAGER:	Jeffey & Dillia	Name/date	3-04					
	" 11 U	Name/date						

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	T	1	Remedia	ACION AL ING INC	ss Creek Project,	west Chicago, it.		·	T
		'	Overt	ourden Piles Tr	acking Spreadsh	eet for 2004	l		1
		<u> </u>							<u> </u>
	1			Prepared By	: BBLES on 11/15	/04			
			-				-		
	<u> </u>	 			Date				
Reach No.	Section No.	Overburden Pile Sample No.	Data Complet	Volume of	Resampled (if	Date Statistical	Date(s) When	Area(s) Used	
reach ito.	Section No.	Janipie No.	Date Sampled	Pile (cys.)	applicable)	Analysis Complete	Backfilled	for Backfill	Comments 10 cys. had elevated scans ar
5A	R5A-3, 4 & 11	OB-1	11/3/2004	186	- N/A	11/5/2004	11/9 & 11/04	R5A-1,3,4,10	was sent to REF as byproduct
5A	R5A-8&11	OB-2	11/9/2004	371		11/10/2004	11/15/2004	R5A-8	
5A	R5A-11	OB-3	11/10/2004	84	N/A	11/12/2004			
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 		TOTALS	ļ	641					
		1							
		For November 2004:		644					
		For November 2004;		641					-
		For December 2004:			-				
		. or December 2004.		-					
		* Monthly totals are has	sed on the date the	e Statistical Anal	vsis of the overhim	den pile was completed			
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BBL

ENVIRONMENTAL SERVICES, INC.

Remedial Action • Management and Construction

Transmittal

KC 014

		IC 014	
Transmitted via I	Hand Delivery	BBL Environmental Services, Inc. 725 Dayton Ave., Gate #2, West Chicago, IL 607 Field Office No. :(630) 293-1932	85
800 Weyı	ppel Gee Chemical Li rauch Street cago, IL 60185	Date: November 11, 2004 File: 71012 Kress Creek Remedial Action West Chicago, IL	
We are sending y	draw		
Quantity	Identifying Numbers#	Title	Action*
Reach 5A		Reach 5A - Overburden Lift Sample Results	
1	Pile # OB-2	KC-R5A-110904-OB-2A through 2E (approved 11/10/04)	I
2	11/12/04	Overburden Piles Tracking Spreadsheet for 2004	I
*Action letter cod	e: R - revie S - resul	,	
Comments:			, .
Sincerely,			
Michael	·^\		
Michael F. Savag	•	a my	

MFS/mfs Enclosures

Senior Engineer II

CC:

Mark Gravelding, BBLES Mark Schmitt, Sevenson

OVERBURDEN PILE SAMPLING

Excavation Area:	Kress Creek (KC) Reach 5 A			
Date Sampled:	11/9/04			
PILE #: OB-2- R5A (8&11)	Est. Volume of Pile in Cubic Yards:	371		
Sample#	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)
KC-R5A-110904-OB-2A	1.8			
KC-R5A-110904-OB-2B	2.3			
KC-R5A-110904-OB-2C	2.3			
KC-R5A-110904-OB-2D	2.5			
KC-R5A-110904-OB-2E	3.2			
KC-R5A-110904-OB-2F	2.4			
KC-R5-110904-OB-2QC		·		
		3.5	0.3	0.1
Number of Samples (n)	6			
Average (Mean of the sample population) (X bar)	2,4			
Average of samples is <7.2 pCi/g, Proceed with 0 SOP-214, Paragraph Standard Deviation of sample population (S ₁)	oh 6.12 			
or earribio population (31)	0.4			
U _α (True Mean) = (X bar) + (t * (S ₁ /sqrt(n))) Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	2.8	"t" value 2.015		
Release Criteria	7.2			
U _∆ < Release Criteria?	SAMPLES TESTED MEET 95% CONFIC LIFT IS RADIOLOGICALLY ACCEPTA AS ONSITE BACKFILL PER SO	BLE FOR USE		
REVIEWED: BBLES/SES Mu	Malf. Savese 22	awater	11-10-04	
APPROVED: OFFSITES MANAGER:	William !	Name/date (- 10 - 04		
ϵ		Name/date		

 $S_{dup} = sqrt (S_1^2 + S_2^2) =$ 0.46 Check if QC Sample Dup. is within 3 Standard Deviations (3 $\rm S_{\rm dup})$ of the mean of the sample population, per SOP 214, paragraph 12.1 $3 \times S_{dup} =$ 1.38 Mean + 3 S_{dup} = QC < (Mean + 3S_{dup})? 3.8 O.K. Mean - 3 S_{dup} = 1.0 QC > (Mean - 3S_{dup})? O.K.

 S_{dup}

Std. Dev. of the

duplicate sampling &

measurement

Number of Samples Required Per SOP 214: 6

 S_2

Std. Dev. for the

analyses of the

duplicate sample

Kress Creek Samples

Date Samples Recieved:

11/9/2004

Overburden

Dry Weight Corrected

	Dry Weight Co	orrected						
Sample Location	U-238 in pCi/g	+ / - in pCi/g	Th-232		Ra-226	+/-	Total Uranium	Total Radium
KC-R5A-110904-OB-2A	< 1.0	n/a	in pCi/g 1,2	in pCi/g	in pCi/g	in pCi/g	in pCi/g	in pCi/g
KC-R5A-110904-OB-2B KC-R5A-110904-OB-2C	< 1.2 0.9	n/a	1.5	0.2 0.2	0.5 0.8	0.1	< 2.0	1.8
KC-R5A-110904-OB-2D KC-R5A-110904-OB-2E	< 1.0	0.6 n/a	1.5	0.2	0.8	0.1	< 2.4 1.9	2.3
KC-R5A-110904-OB-2F	1.0 < 0.7	0.7	2.6	0.2	0.8	0.1	< 2.1	2.5
KC-R5A-110904-OB-2QC	< 0.8	n/a n/a	1.6 2.8	0.2	0.7	0.1	2.1 < 1.5	3.2 2.4
			2.0	0.3	0.6	0.1	< 1.6	3.5

all samples counted in the marinelli geometry for 30 minutes

Reviewed

		~~~~~~		NEIT-WICE	see Unemical LLU				
	1	Ţ~~~	Remedial	Action at the Kre	ess Creek Project,	West Chicago, IL			· · · · · · · · · · · · · · · · · · ·
	<u> </u>						L		I
	1	T	Overt	ourgen Piles Ir	acking Spreadsh	leet for 2004			
	l	<u> </u>	·	Prepared By	: BBLES on 11/12	204	Ļ		L
		T		i repared by	l GDEEC ON THIS	1			T
		1	]		Date				
		Overburden Pile		Volume of	Resampled (if	Date Statistical	Date(s) When	Area(s) Used	
Reach No.	Section No.	Sample No.	Date Sampled	Pile (cys.)	applicable)	Analysis Complete	Backfilled	for Backfill	Comments
5A	R5A-3, 4 & 11	OB-1	· 11/3/2004	186	N/A	44.50004	4410 6 44/04	DEA 40 440	10 cys. had elevated scans an was sent to REF as byproduct.
5A	R5A-8 & 11	OB-1	11/9/2004	371	N/A	11/5/2004 11/10/2004	11/9 & 11/04	R5A-1,3,4,10	was sent to REF as byproduct.
	Nort Suit	022	7 17 07 200 4	0/1	N/A	14/10/2004			
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		TOTALS		557					
		For November 2004:		557					
		F D 2005							
		For December 2004:							
			<del></del>						ļ
		* Monthly totals are bas	ed on the date the	Statistical Anal	vsis of the overhim	den nile was completes			
			・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・	wwwwwcai mildi	Inia or are overbul	שביי אוום זימס כטווואופופנ	٠.		i e

# BBL

ENVIRONMENTAL SERVICES, INC.

Transmittal

Remedial Action • Management and Construction

					KC 009	
Tra	nsmitted via F	land Delivery		725 Day	vironmental Services, Inc. yton Ave., Gate #2, West Chicago, IL 601 ffice No. :(630) 293-1932	85
To:				Date:	November 9, 2004	
	800 Weyr	Gee Chemical LI rauch Street cago, IL 60185	L.C	File:	71012 Kress Creek Remedial Action West Chicago, IL	
	e are sending y	☐ drawi		] letters	· · · · · · · · · · · · · · · · · · ·	
ı	Quantity	Identifying	T	10-4-1	Title	Action*
	Quantity	Numbers #				7100011
	Reach 5A		Reach 5A - O	verburd	len Lift Sample Results	·
	1	Pile # OB-1	KC-R5A-110304	4-0B-1A	through 1E (approved 11/05/04)	1
	2	11/09/04	Overburden Pile	es Tracki	ng Spreadsheet for 2004	1
٠						
	1	Pages 058 and 059		cubic ya	on's HP logbook with elevated gamma rds of material to be sent off as potential	1
*Ac	ction letter cod	le: R - revie S - resul	w N - revie	wed and	noted I - for your information Y - for your approval	
Of R5 and	A-3, R5A-4 ar d were isolate	nd R5A-11, 10 c d and will be ser	ubic yards exhibit	ted eleva potential	3-1 that was excavated from Reach 5A in a leted readings in the confirmatory gamma subsproduct material. A copy of Sevenson' erial is attached.	surveying
Sir	ncerely,					
ВВ	L ENVIRONN	IEŅTAL SERVI	CES, INC.		·	

Michael F. Savage, P.E. Senior Engineer II

MFS/mfs Enclosures CC:

Mark Gravelding, BBLES Mark Schmitt, Sevenson

Savage

#### **OVERBURDEN PILE SAMPLING**

Krlas (	reek (KC)			
Excavation Area:	WWTP Reach 5A			
Date Sampled:	11/3/04			
PILE #: OB-1- R5A (3,4&11)	Est. Volume of Pile in Cubic Yards:	186		
Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)
KC	3.2			
*C ***********************************	2.0			
<u>KC</u> **W**********************************	3.6			
KC WWTP-R5A-110304-OB-16	2.3			
10A-110304-OB-1E	2.6		•	
KC -WWFP-R5-110304-0B-1QC				
70 - 10304-0B-1QC		3.0	0.2	1.2
Number of Samples (n)	5			
Average (Mean of the sample population) (X bar)	2.7			
Average of samples is <7.2 pCi/g, Proceed with 0 SOP-214, Paragra	Confidence Level Check described in oh 6.12			
Standard Deviation of sample population (S ₁ )	. 0.6			
U _α ( <b>True Mean</b> ) = (X bar) + (t * (S ₁ /sqrt(n))) Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	3.3	"t" value 2.132		
Release Criteria	7.2			
U∆< Release Criteria?	SAMPLES TESTED MEET 95% CONFIC LIFT IS RADIOLOGICALLY ACCEPTAL AS ONSITE BACKFILL PER SO	BLE FOR USE		
REVIEWED: BBLES/SES Mucha	UF. Savage 11/5/04 /	Thomas !	11-5-04	
APPROVED: OFFSITES MANAGER:	many)	Name/date		
11.5.07		Name/date		

Check if QC Sample Dup of the sample	o. is within 3 S population, p	Standard Deviations (3 S _{dup} ) of er SOP 214, paragraph 12.1	the mean
3 x S _{dup} =	2.74		
Mean + 3 S _{dup} =	5.5	QC < (Mean + 3S _{dup} )?	0.K.
Mean - 3 S _{dup} =	0.0	QC > (Mean - 3S _{due} )?	0.K.

 $S_{dup}$ 

Std. Dev. of the

duplicate sampling &

measurement

0.91

Number of Samples Required Per SOP 214: 6

S2

Std. Dev. for the analyses of the

duplicate sample

0.7  $S_{dup} = sqrt (S_1^2 + S_2^2) =$ 

# Sewage Treatment Plant Samples

Date Samples Recieved:

11/3/2004

#### Overburden

Dry Weight Corrected

		<del>                                     </del>						·	
	Sample Location	U-238 in pCi/g	+ / - in pCi/g	Th-232 in pCi/g	+ / - in pCi/g	Ra-226	+/-	Total Uranium	Total Radium
KC	WWTP-R5A-110304-OB-1A	1.2	0.6	2.6		in pCi/g	in pCi/g	in pCi/g	in pCi/g
EC	WWTP-R5A-110304-OB-1B	1.8	0.9	1.2	0.2	0.6	0.1	2.4	3.2
	WWTP-R5A-110304-OB-1C	2.1	0.9	2.9	0.2	0.7	0.1	3.6	2.0
	WWTP-R5A-110304-OB-1D	< 1.0	N/A	1.6	0.3	0.7	0.1	4.3	3.6
KC.	₩₩ <b>₽</b> P-R5A-110304-OB-1E	< 0.9	N/A	1.9	0.2	0.7	0.1	< 2.0	2.3
KC.	₩₩ <b>T</b> P-R5A-110304-0B-1QC	< 1.3	N/A	2.2	0.2	0.7	0,1	< 1.8	2.6
		1.0	19/7	2.2	0.2	0.8	1.2	< 2.7	3.0

changes made by MF Savage, BBLES 11/5/04

all samples counted in the marinelli geometry for 30 minutes

Reviewed

Date

Rv.

11/5-12004

			Remedial	Action at the Kre	Gee Chemical LLC ess Creek Project,	West Chicago, IL			
					,				
			Over	burden Piles Tr	acking Spreadsh	eet for 2004			
				Prepared By:	BBLES on 11/09	1/04			
					<u></u>				
					Date	D 4 D4 45 45 41	D-4-(-) 14/5	8 /- \	
		Overburden Pile	_	Volume of Pile		Date Statistical	Date(s) when	Area(s) Used for	
Reach No.	Section No.	Sample No.	Date Sampled	(cys.)	applicable)	Analysis Complete	Backfilled	Backfill	Comments
			4.4.0.000.4	400	N1/A	44/5/0004			10 cys. had elevated scans a was sent to REF as byproduc
5A	R5A-3, 4 & 11	OB-1	11/3/2004	186	N/A	11/5/2004			was sell to REF as byproduc
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			-	1	<u> </u>			1	
		* Monthly totals are ba	sed on the date t	he Statistical Ana	alysis of the overbu	irden pile was complet	ed.		
			T	T	T [*]	Ţ <u>'</u>	T	T	



#### Appendix L

Imported Material Sampling Data

# $\underset{\text{environmental services, inc.}}{BBL}$

# Transmittal

Remedial Action • Management and Construction

KC 069

Tra	nsmitted via H	land Delivery		800 We	yrauch St	tal Services, Inc. ., West Chicago, IL 60185 (630) 293-7695	
To:	Mark Krip			Date:	March 3	0, 2006	
	•	LC auch Street cago, IL 60185		File:		i02 reek Remedial Action, Reach 5A icago, IL	Λ.
We	are sending y	/ou: ⊠ herev ☐ drawi		under letters	separate	cover other	
lf m			d, please notify u	s at once			
	Quantity	Identifying Numbers#			Title		Action*
	1	Sec 02200	Backfill Soil Test (See Comments		A HAZ, F	RAD for Lootens Clay & Topsoil	I
*Ac	tion letter cod	e: R - revie S - resul			noted	I - for your information Y - for your approval	
Cor 601		source for Clay a	& Topsoil Backfill	is Art Lo	otens & S	Son Inc.0S551 Joliet Rd. West C	hicago IL
Sin	cerely,						
Mic	_ ENVIRONM MWM hael F. Savag hior Engineer I		ces, INC.				
	S/mfs closures			CO	o: Ma	ark Schmitt, Sevenson	



# SEVENSON ENVIRONMENTAL SERVICES, INC. 2749 LOCKPORT RD. NIAGARA FALLS, NY 14305 (716) 284-0431 Fax (716) 284-7645

KC 5A River Portion West Chicago, IL

#### LETTER OF TRANSMITTAL

To:	Mike Savage			Date:	
	BBLES		Tra	insmittal No.:	005
•				Job Number:	
•				RE:	Backfill Soil Testing
		,	Addre	ess Reply To:	Mike Crystal
Ma	Are Sending t	he Following:			2749 Lockport Road
	Attached	ine i oliewing.			Niagara Falls, NY 14305
Ĥ	Under Separa	ite Cover Via			
	' 		□ n ∴.t.		Work Plans
	Specifications		Prints		Samples
	Certificates O	•	Drawings		Report
<u> </u>	Manufacturer		Subcontract		X Submittals
	O&M Manuals		Copy of Letter		Other:
	Electronic Co	ру	Records		Outer.
	Copies	Date	Spec. Number		Description
	2	10/20/2005	Section No. 02200	Backfill Soil	Testing - RCRA Haz, Rad for Lootens
				clay and tops	soil.
The	1	mitted as Chec	<del></del>	*** 1	Resubmit Copies for Approval
	For Approval		Approved as Sub		Submit Copies for Distribution
X	For Your Use		Approved as Note Returned for Corr		Return Corrected Prints
<u> </u>	As Requeste				Preliminary/Reference Only
L	For Review a	nd Comment	Issued for Constr	uction	Prints Returned After Loan
	Tran Dida Dua				Other
<u></u>	For Bids Due				
Re	emarks:				
	Any Quest	ions or comr	ments please call Mark Sch	mitt on site	e at
	630-293-7	926 or Mike	Crystal at 716-284-0431.		
				_ Sent By	
				Received By	1. Produta

# $\underset{\text{environmental services, inc.}}{BBL}$

# Transmittal

Remedial Action • Management and Construction

KC 069

Tra	ansmitted via i	Hand Delivery	80	00 Weyra	nmental Services, Inc. uch St., West Chicago, IL 60185 · No. :(630) 293-7695	
То	Tronox L 800 Wey			le: 7′ Kr	arch 30, 2006 1014.002 ess Creek Remedial Action, Reach 5A est Chicago, IL	
W∈	e are sending	you: ⊠ herev □ draw		under sep letters	parate cover other	
lf n	naterial receiv	ed is not as liste	d, please notify us a	t once.		
	Quantity	Identifying Numbers #			Title	Action*
	1	Sec 02200	Backfill Soil Testing (See Comments Be		IAZ, RAD for Lootens Clay & Topsoil	
			·			
*Ac	tion letter cod	e: R - revie S - resub		and note	ed I - for your information Y - for your approval	
Cor 601	mments: The s	source for Clay 8	& Topsoil Backfill is A	Art Looter	ns & Son Inc.0S551 Joliet Rd. West Chi	icago IL
Sin	cerely,					
Mic						
	S/mfs closures			cc:	Mark Schmitt, Sevenson	

Configuration : DKA200: [GAMMA.SCUSR.ARCHĮVE] SMP_KC1006050STS001 GE1 FVSU 88281.CNF;1

---- Sample Information ----

Sample Title : KC-100605-OSTS-001

Sample ID 

Sample Type : Dry weight Sample Geometry :

Sample Number : 88281 Spctrm Collector : ROB MADDOX

Analyzed By

---- Sample Decay/Count Information ----

: 8-OCT-2005 00:00:00. Acquisition date : 8-OCT-2005 10:40:48. Sample Date

: 0 10:40:48.98 % dead time : 0.0% Decay time

Elapsed live time: 0 00:45:00.00 Elapsed real time: 0 00:45:01.29

---- Detector Parameters ----

Energy cal. time : 9-FEB-2005 11:15:05. Energy cal. oper.: RAY LANCASTER

Detector name : GE1 Counting geometry: FVSU

Effic. cal. time : 9-FEB-2005 13:19:57. Effic. cal. oper.: RAY LANCASTER

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/gram)	Act error	MDA (pCi/gram)	MDA error	Act/MDA
K-40	1.543E+01	1.905E+00	2.894E-01	2.967E-02	53.310
RA-226	6.488E-01	8.096E-02	1.461E-01	2.267E-02	4.442
TH-232	8.957E-01	1.654E-01	1.507E-01	1.492E-02	5.942
U-238	1.062E+00	4.723E-01	7.570E-01	9.499E-02	1.403

10-8-05

#### Generated 8-OCT-2005 12:14:16

Configuration : DKA200: [GAMMA.SCUSR.ARCHIVE] SMP_KC1006050SBF002_GE1_FVSU_88282.CNF;1

Buckfill Clay

Sample Title : KC-100605-OSBF-002

: kcl00605osbf002 Sample Quantity : 1.00900E+03 gram

: Dry weight Sample Geometry : Sample Type

Sample Number : 88282 Spctrm Collector : ROB MADDOX

Analyzed By

Sample ID

---- Sample Decay/Count Information ----

: 8-OCT-2005 00:00:00. Acquisition date : 8-OCT-2005 11:28:55. Sample Date

: 0 11:28:55.31 % dead time : 0.0% Decay time

---- Detector Parameters ----

Energy cal. time : 9-FEB-2005 11:15:05. Energy cal. oper.: RAY LANCASTER

Detector name : GE1 Counting geometry: FVSU

Effic. cal. time : 9-FEB-2005 13:19:57. Effic. cal. oper.: RAY LANCASTER

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/gram)	Act error	MDA (pCi/gram)	MDA error	Act/MDA
K-40	1.900E+01	2.292E+00	3.253E-01	3.334E-02	58.414
RA-226	7.300E-01	8.888E-02	1.484E-01	2.303E-02	4.921
U-238	1.398E+00	5.203E-01	7.596E-01	9.531E-02	1.841

#### ---- Non-Identified Nuclides ----

Key-Line

MDA error Act/MDA Activity K.L. Act error MDA (pCi/gram) Ided (pCi/gram) Nuclide 3.106E-01 3.073E-02 6.975E-01 + 2.053E-01 TH-232

#### WASTE STREAM TECHNOLOGY, INC.

302 Grote Street Buffalo, NY 14207 (716) 876-5290

Analytical Data Report

Report Date: 09/30/05 Work Order Number: 5l23013

Prepared For Mike Crystal Sevenson Environmental Services 2749 Lockport Road Niagara Falls, NY 14302 Fax: (716) 285-4201

Site: E868

Enclosed are the results of analyses for samples received by the laboratory on 09/23/05. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Brian S. Schepart, Ph/D., Laboratory Director

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS
NYSDOH ELAP #11179 NJDEPE #73977 PADEP #68757





Project: Kerr McGee

2749 Lockport Road

Project Number: E868

Niagara Falls NY, 14302 Project Manager: Mike Crystal

Reported: 09/30/05 16:43

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
AL Clay	5123013-02	Soil	09/22/05 17:32	09/23/05 10:10

Project: Kerr McGee

2749 Lockport Road Niagata Falls NY, 14302 Project Number: E868 Project Manager: Mike Crystal

Reported: 09/30/05 16:43

#### TCLP Metals by 6000/7000 Series Methods Waste Stream Technology Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
AL Clay (5I23013-02) Soil	Sampled: 09/22/05 17:32	Received: 09	0/23/05 1	0:10		,			
Mercury	ND	0.001	mg/L	Į	A152922	09/29/05	09/29/05	EPA 7470A-TCLP	
Silver	ND	0.025	it	5	A152806	09/28/05	09/28/05	6010B	
Arsenic	ND	0.045	Ш	н	u	II	09/28/05	п	
Barium	0.349	0.025	и	н	п	к	09/28/05	If	
Cadmium	ND	0.025	IT	а	u	11	09/28/05	ų	
Chromium	ND	0.025	lt.	и	łu	M	o	it	
Lead	ND	0.075	it	al	ıı	d	o	ıt	
Selenium	ND	0.095	•	u	н	u	II	u	

2749 Lockport Road Niagara Falls NY, 14302 Project: Kerr McGee

Project Number: E868 Project Manager: Mike Crystal Reported: 09/30/05 16:43

## TCLP Volatile Organic Compounds by EPA Method 1311/8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
AL Clay (5123013-02) Soil	Sampled: 09/22/05 17:32	Received: 09	/23/05 10	):10			-		
vinyl chloride	ND	10	ug/l	I	AI53002	09/30/05	09/30/05	8260	U
1,1-dichloroethene	DM	10	п	11	н	ш	п	II	U
2-butanone	ND	100	h	п	н	и		rr	U
chloroform	ND	10	ą	и	II	11	н	it	U
carbon tetrachloride	ND	10	и	it	17	II	a	44	Ų
benzene	ND	10	н	1)	łt	ч	**	11	Ü
1,2-dichloroethane	ND	10	ч	11	п	Ч	şe.	u	U
trichloroethene	ND	10	ц	Ð	17	It	ii .	u	U
tetrachloroethene	ND	10	u	If	ц	t#	u	11	Ţ
chlorobenzene	ND	10	ti	a	15	н	u	ш	Ţ
1,4-dichlorobenzene	ND	10	II	н	ч	fı	a	ίτ	į
Surrogate: 1,2-Dichloroethar	1¢-d4	101%	766-	728			4		
Surrogate: Toluene-d8		104 %	81-	118	u	n	13	и	
Surrogate: Bromofluorobenza	ene	101 %	85-	123	11	н	**	n	

2749 Lockport Road Niagara Falls NY, 14302 Project: Kerr McGee

Project Number: E868
Project Manager: Mike Crystal

Reported: 09/30/05 16:43

#### TCLP Pesticides by EPA Method 1311/8080A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
AL Clay (5123013-02) Soil S	Sampled: 09/22/05 17:32	Received: 09	/23/05 [	0:10					
Gamma-BHC (Lindane)	ND	0.040	ug/l		AI52821	09/28/05	09/29/05	8081	U
Heptachlor	ND	0.040	я	н	и	k	ч	If	IJ
Heptachlor Epoxide	ND	0.040	11	и	н	а			U
Endrin	ND	0.040	13	a	ч	н	O .	11	U
Methoxychlor	ND	0.040	п	d	(ı	н	II	ш	U
Chlordane	סא	0.800	н	u	п	п	ч	н	U
Toxaphene	ND	1.00	н	ш	и	u	II.	н	U
Surrogate: Tetrachloro-meta-x	vlene	102 %	67-	123	"	<i>u</i>	,		
Surrogate: Decachlorobipheny		94.5 %	68-	. [ 32	a	ır	, u	n	

2749 Lockport Road Niagara Falls NY, 14302 Project: Kerr McGee

Project Number: E868 Project Manager: Mike Crystal Reported: 09/30/05 16:43

# TCLP Herbicides by EPA Method 1311/8151A

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
AL Clay (5123013-02) Soil	Sampled: 09/22/05 17:32	Received: 09	7/23/05 1	0:10					
2,4-D	ND	0.4	ug/l		AI52712	09/27/05	09/30/05	8151	U
2,4,5-TP (Silvex)	ND	0.4	u	п	n n	и	п	11	U
Surrogale: 2,4-DCPAA		103 %	24	-146	·····- <del>//</del>	<i>n</i> ····	<i>u</i> · · ·	a	

2749 Lockport Road Niagara Falls NY, 14302 Project: Kerr McGee

Project Number: E868

Project Manager: Mike Crystal

Reported: 09/30/05 16:43

# TCLP Semivolatile Organic Compounds by EPA Method 1311/8270C

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
AL Clay (5123013-02) Soil	Sampled: 09/22/05 17:32	Received: 09	/23/05 1	0:10					
pyridine	סא	8	ug/l	1	A152703	09/29/05	09/30/05	8270C-TCLP	U
1.4-dichlorobenzene	ND	8	u	11	d	**	**	u	U
Total cresols (o,m & p)	ПИ	24	п	10	n	н	si .	п	U
hexachloroethane	ND	8	U	Ħ	н	N		11	U
nitrobenzene	ND	8	0	>1	lr .	и	U	п	U
hexachlorobutadiene	ND	8	н	ĸ	и	u	II	r)	U
2,4,6-trichlorophenol	ND	16	II	п	II	ıl	В	II	IJ
2,4,5-trichlorophenol	ND	8		и	11	11	u .	υ	U
2,4-dinitrotoluene	ND	8	IT	tl	n	. 41	"	П	U
hexachlorobenzene	ND	8	lt	a	u	н	л	н	U
pentachlorophenol	ND	16	TI	-0	n n	#	н	.0	Ţ
Surrogata: 2-Fluorophenol	777 M. (M. 1940-1941) P. (T. 1	36.5%	74	1-53	и		n · ·	"	
Surrogate: Phenol-d6		24.0 %	10	7-35	n	u	"	ıt	
Surrogate: Nitrobenzene-d5		60.5 %	3.5	3-96	rr .	"	"	"	
Surrogate: 2-Fluorobiphenyl		63.0%	4 1	1-95	tı	11	ıt	п	
Surrogate: 2,4,6-Tribromophe	nol	77.5 %	44	-124	n	и	н	"	
Surrogate: Terphenyl-d14		59.0 %	42	-127	"	u	a	п	

Project: Kerr McGeo

2749 Lockport Road

Project Number: E868 Project Manager: Mike Crystal Reported: 09/30/05 16:43

Niagara Falls NY, 14302

## Conventional Chemistry Parameters by EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes	
AL Clay (5123013-02) Soil Sampled: 09/22/05 17:32 Received: 09/23/05 10:10										
рН	7.94	0.10	pH Units	l	AI52916	09/29/05	09/29/05	EPA 9045C		

Project: Kerr McGee

2749 Lockport Road

Project Number: E868

Niagara Falls NY, 14302

Project Manager: Mike Crystal

Reported: 09/30/05 16:43

## Physical Parameters by APHA/ASTM/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
AL Clay (5I23013-02) Soil	Sampled: 09/22/05 17:32	Received: 05	0/23/05 1	0:10					
Ignitability by Flashpoint	>200		deg F	1	AI52818	09/28/05	09/28/05	EPA 1010	
Reactive Cyanide	ND	40.0	mg/kg	н	AI53016	09/28/05	09/30/05	Section 7.3.3.2	
Reactive Sulfide	ND	40.0	"	н	A153019	R	09/30/05	Section 7.3.4.2	

Sevenson Environmental Services	Project: Kerr McGee	
2749 Lockport Road	Project Number: E868	Reported:
Niagara Falls NY, 14302	Project Manager: Mike Crystal	09/30/05 16:43

#### Notes and Definitions

U Analyte included in the analysis, but not detected

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference



302 GROTE STREET BUFFALO, NY 14207

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PROJECT		E80	28		SITE NAM	1E: Kerr-mc686	SIZE &		/\$/	$\sqrt{}$	/	/	$\overline{\mathcal{I}}$	/	1/	\$ /		
SAMPLER	S (SIGN	IATURE	): / YE	8	57		NO. OF CON-	/					1	' /	PRESENVA		REMARKS	
SAMPLE NO. /AL	DATE	ПМЕ	COMP	GRAB	MATRIX	SAMPLE LOCATION	TAINERS	/ 9	¥/ -			/-						
709501L	%22	1730	X		50	ALTOPSOIL	1 402										-(i)160z	Ø
AL CLAY	9/22	1732	X		50	ALCLAY	1402	×								υ	ž ę	Øa
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LAB USE: REFRIGERATOR # _____ SHELF # ____

# WASTE STREAM TECHNOLOGY, INC.

302 Grote Street Buffalo, NY 14207 (716) 876-5290

Analytical Data Report Report Date: 10/14/05 Work Order Number: 5J07008

Prepared For Rick Elia Jr. Sevenson Environmental Services 2749 Lockport Road Niagara Falls, NY 14302 Fax: (716) 285-4201

Site: E868

Enclosed are the results of analyses for samples received by the laboratory on 10/07/05. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Brian S. Schepart, Ph.D., Laboratory Director

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS NYSDOH ELAP #11179 NJDEPE #73977 PADEP #68757





Sevenson Environmental Services 2749 Lockport Road

Niagara Falls NY, 14302

Project: Kerr McGee

Project Number: E868 Project Manager: Rick Elia Jr. Reported: 10/14/05 16:32

ANALYTICAL REPORT FOR SAMPLES

ANALYIK	Laboratory ID	Matrix	Date Sampled	Date Received
Sample ID	5J07008-01	Soil	10/06/05 16:35	10/07/05 10:15
AL Topsoïl	******			

2749 Lockport Road Niagara Falls NY, 14302 Project: Kerr McGee

Project Number: E868 Project Manager: Rick Elia Jr. Reported: 10/14/05 16:32

# TCLP Volatile Organic Compounds by EPA Method 1311/8260B

	***	Ott Care		0,0					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Sampled: 10/06/05 16:35	Received:	10/07/0	5 10:1 <u>5</u>					
AL Topsoil (5J07008-01) Soil		10	ug/l	1	AJ51303	10/13/05	10/13/05	8260	(
vinyl chlorid <del>c</del>	ND	- ·	ng,	, u	1)	II	п	n	Į
l,1-dichloroethene	מא	10	n	u	sı.	п	**	ľ	(
2-butanone	ND	100			п	8	н	R	1
chloroform	ИD	10	и		u u	11	и	и	1
carbon tetrachloride	ND	10	н	н		4	"	si .	
	ND	10	п	"	11		ш	n	
cnzene	ИD	10	16	u	#	ч		и	
1,2-dichloroethane	ND	10	t/	11	11	u	11	и	
trichloroethene	ND	10	u	tt	n	n	п		
tetrachloroethene		10	В	ır	u	tt	0	11	
chlorobenzene	ND			n	11	ч	ıt	ti .	
1,4-dichlorobenzene	ND	10					. ,,	, ,,	
Surrogate: 1,2-Dichloroethane	-d4	83.0 %		5-128		,,	"	u	
Surrogate: Toluene-48		90.3 %	8.	1-118	"		**	"	
Surrogate: Tottlene-48 Surrogate: Bromofluorobenzer	ae	92.0 %	8.	5-/23	il	н	"		

2749 Lockport Road Niagara Falls NY, 14302 Project: Kerr McGee

Project Number: E868 Project Manager: Rick Elia Jr. Reported: 10/14/05 16:32

# Conventional Chemistry Parameters by EPA Methods

	* 1 14	0							i i
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Sampled: 10/06/05 16:35 7.82		: 10/07/09 pH Units		AJ50726	10/07/05	10/07/05	EPA 9045C	

Sevenson Environmental Services 2749 Lockport Road Niagara Falls NY, 14302 Project: Kerr McGee Project Number: E868

Reported: 10/14/05 16:32

# Physical Parameters by APHA/ASTM/EPA Methods

Project Manager: Rick Elia Jr.

	YY a	tate arter							
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Sampled: 10/06/05 16:35	Received:	10/07/09	5 10:15 I	AJ51012	10/10/05	10/10/05	EPA (010	
Ignitability by Flashpoint Reactive Cyanide Reactive Sulfide	ND 40.1	40.0 40.0	mg/kg	II	AJ51330 AJ51329	10/11/05	10/14/05 10/14/05	Section 7.3.3.2 Section 7.3.4.2	(.

Sevenson Environmental Services 2749 Lockport Road Niagara Falls NY, 14302 Project: Kerr McGee

Project Number: E868 Project Manager: Rick Elia Jr. Reported: 10/14/05 16:32

#### Notes and Definitions

U Analyte included in the analysis, but not detected

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference



302 GROTE STREET BUFFALO, NY 14207 (716) 876-5290

5	BD	TAT
-	~	

## CHAIN OF CUSTODY RECORD

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PROJECT	NO:	E84	E		SITE NAM	E: Kerl-Mc666	SIZE &		\\ \frac{4}{2}\	/ ,	/ /	Τ,	Τ,	Τ,	PRESERVATION TO	\$2 /		
SAMPLER			114	18	57		NO. OF CON- TAINERS		3/	/		/	1	/	Sept.		REMARKS	
SAMPLE NO.	DATE	ПМЕ	COMP	GRAB	MATRIX	SAMPLE LOCATION		ν		_	_				/ E			
SAMPLE NO. AL TOPSOIL	9/22	itigo	X		50	ALTOPSOIL	1 402									(1)400	t(1)1608	$\emptyset$
AL CLAY		1732	. 1		50	ALCLAY	1402	×								L	r,	<u>Ø</u> a
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### WASTE STREAM TECHNOLOGY, INC.

302 Grote Street Buffalo, NY 14207 (716) 876-5290

Analytical Data Report

Report Date: 10/17/05 Work Order Number: 5l23013

Prepared For

Rick Elia Jr.

Sevenson Environmental Services 2749 Lockport Road Niagara Falls, NY 14302

Fax: (716) 285-4201

Site: E868

Enclosed are the results of analyses for samples received by the laboratory on 09/23/05. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Brian S. Schepart, Ph.D., Laboratory Director

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS
NYSDOH ELAP #11179 NJDEPE #73977 PADEP #68757





2749 Lockport Road Niagara Falls NY, 14302 Project: Kerr McGee

Project Number: E868

Project Manager: Rick Blia Jr.

Reported: 10/17/05 10:07

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
AL Topsoil	5123013-01	Soil	09/22/05 17:30	09/23/05 10:10

2749 Lockport Road Niegara Falls NY, 14302 Project: Kerr McGee

Project Number: E868 Project Manager: Rick Elia Jr. Reported: 10/17/05 10:07

# TCLP Metals by 6000/7000 Series Methods

### Waste Stream Technology Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
AL Topsoil (5123013-01) Soil	Sampled: 09/22/05 17:30	Received	09/23/0:	5 10:10					
Mercury	ND	100.0	mg/L	1	A152922	09/29/05	09/29/05	EPA 7470A-TCLP	
Silver	ND	0.025	ır	5	A152806	09/28/05	09/28/05	6010B	
Arsenic	ND	0.045	1)	и	п	1)	II.	11	
Barium	0.622	0.025	п	н	u	11	16	n	
Cadmium	ND	0.025	(4	11	u	u	u	п	
Chromium	ND	0.025	u	11	q	n	и	ч	
Lead	ND	0.075	н	u	н	ıı	u	ц	
Selenium	ND	0.095	tr	u	It	D	II	R	

2749 Lockport Road Niagara Falls NY, 14302 Project: Kerr McGee

Project Number: E868 Project Manager: Rick Elia Jr. Reported: 10/17/05 10:07

## TCLP Pesticides by EPA Method 1311/8080A Waste Stream Technology Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Betch	Prepared	Analyzed	Method	Notes
AL Topsoil (5123013-01) Soil	\$ampled: 09/22/05 17:30	Received	: 09/23/05 1	0:10					
Gamma-BHC (Lindane)	ND	0.040	ug/l	1	AI52821	09/28/05	09/29/05	8081	- 1
Heptachlor	ND	0.040	11	II	11	л	ч	п	τ
Heptachlor Epoxide	ND	0.040	Л	n	К	п	n	н	(
Endrin	ND	0.040	л	t1	a	n	II	n	Ī
Methoxychlor	ND	0.040	К	u	n	. 9	t	h	ı
Chlordane	ND	0.800	К	н	u	u	U	н	1
Toxaphene	ND	1.00	я	u	Ħ	Ħ	tr.	н	1
Surrogate: Tetrachloro-meta-xyle	MR.	708%	67-12	23	· · · · y- · ·	. "	u	"	
Surrogate: Decachlorobiphenyl		107 %	68-13	32	n	ч	n .	u	

2749 Lockport Road Niagara Falls NY, 14302 Project: Kerr McGee

Project Number: E868

Project Menager: Rick Elia Jr.

Reported: 10/17/05 10:07

## TCLP Herbicides by EPA Method 1311/8151A Waste Stream Technology Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
AL Topsoil (5123013-01) Soil	Sampled: 09/22/05 17:30	Received:	09/23/0	5 10:10					
2,4-D	ND	0.4	ug/l	t	A[527]2	09/27/05	09/30/05	8151	Ū,
2.4,5-TP (Silvex)	ND	0.4	9	n	и	(1	u	11	U
Surrogate: 2,4-DCPAA		83.5 %	24-	146	u	"	u	11	

Project: Kerr McGee

2749 Lockport Road Niagara Falis NY, 14302

Project Number: E868
Project Manager: Rick Elia Jr.

Reported: 10/17/05 10:07

# TCLP Semivolatile Organic Compounds by EPA Method 1311/8270C Waste Stream Technology Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
AL Topsoil (5I23013-01) Soil	Sampled: 09/22/05 17:30	Received:	09/23/05	10:10					VV
pyridine	ND	8	ug/l		AI52703	09/29/05	09/30/05	8270C-TCLP	Ū.
1,4-dichlorobenzene	MD	8	и	11	п	И	н	11	U
Total cresols (0,m & p)	ND	24	u	a	u	11	Ħ	11	į
hexachloroethane	ДИ	8	u	tı	u	u	n	u	Į,
nitrobenzene	ND	8	ti	n	11	. u	И	ч	l
hexachlorobutadiene	ND	8	U	n	п	н	"	п	Į,
2,4,6-trichlorophenol	ND	16	n	и	I#	a a	le	п	ſ
2,4,5-trichlorophenol	ND	8	tf .	II	W	ır	n	п	Ę
2.4-dinitrotoluene	ИD	8	н	ut	It	u	u	л	t
hcxachlorobenzene	ND	8		ч	a	и	11	vf.	J
pentachlorophenol	ND	16	u	11	11	п	и	a	J
Surrogate: 2-Fluorophenol		34.9%	14-2	έż		н	и	u	
Surrogate: Phenol-d6		22.9 %	10-3	<del>3</del> 5	a	u	н	ıı .	
Surrogate: Nitrobenzene-d5		57.5 %	38-9	76	II.	u	"	rr .	
Surrogate: 2-Fluorobiphenyl		59.0 %	41-9	05	п	11	u	ıt	
Surrogate: 2,4,6-Tribromophen	ol	77.9 %	44-1	24	н	п	"	"	
Surrogate: Terphenyl-d14		60.0 %	42-1	27	ıt	и	u	"	

Sevenson Environmental Services Project: Kerr McGee

2749 Lockport Road Project Number: E868 Reported:
Niagara Falls NY, 14302 Project Manager: Rick Blia Jr. 10/17/05 10:07

### Notes and Definitions

U Analyte included in the analysis, but not detected

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

Sevenson Environmental Services 2749 Lockport Road Niagara Falls NY, 14302

Project: Kerr McGee Project Number: E868 Project Manager: Mike Crystal

Reported: 09/30/05 16:43

### Notes and Definitions

U Analyte included in the analysis, but not detected

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference



302 GROTE STREET BUFFALO, NY 14207 (716) 876-5290

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LAB USE: REFRIGERATOR #

ENVIRONMENTAL SERVICES, INC.

Remedial Action • Management and Construction

# Transmittal

KC 072

Trai	nsmitted via H	land Delivery	BBL Environmental Services, Inc. 800 Weyrauch St., West Chicago, IL Field Office No. :(630) 293-7695	_ 60185
То:			Date: April 13, 2006  File: 71014.004  Kress Creek Remedial Acti West Chicago, IL	ion, Reach 5A, 1 & 2
We	are sending y	/ou: ⊠ herev ☐ drawi		
lf m	naterial receive	ed is not as liste	l, please notify us at once.	
	Quantity	Identifying Numbers#	Title	Action*
	1	Sec 02200 1.6C	Imported Backfill & Topsoil Quantities	1
			As Requested by Client Quality Control	
*A(	ction letter cod	de: R - revie S - resu	\ \ f==	
Со	mments:			
Sir	ncerely,			
BE Mi	N ENVIRONI	MENTAL SERVI L. Sa ge, P.E.	ces, INC.	
	=S/bdw iclosures		cc: Mark Schmitt, Sever	nson



# SEVENSON ENVIRONMENTAL SERVICES, INC. 2749 LOCKPORT RD. NIAGARA FALLS, NY 14305 (716) 284-0431 Fax (716) 284-7645

# Kress Creek Remedial Action West Chicago, IL

LETTER OF TRANSMITTAL

	_			Date:	4/12/2006
-	Mike Savage		Tra	nsmittal No.:	013
	BBLES		The state of the s	.lob Number:	71014
	activities to the same of the		and the state of t	RE:	Requested additional information
					for Submittals KC068 and KC069
			Addre	ess Reply To:	Rick Elia
	a O salisa w Al	Collowing:			800 Weyrauch Street
_	Are Sending th	ne Following.			West Chicago, IL 60185
X	Attached	0			
<u></u>	Under Separat	e Cover via			
			Prints		VVork Plans
	Specifications	Ozmalianoo	Drawings		Samples
<u></u>	Certificates Of		Subcontract		X Report
	Manufacturer		Copy of Letter		Submittals
	O&M Manuals		X Records		Other:
	Electronic Cor	ру	Kecolds		
	Copies	Date	Spec. Number		Description
	2	4/12/2006	02200 1.6.C	Imported M	aterial quantity tracking spreadsheets
			And as requested	and corresp	onding required sampling.
				<u> </u>	
Th	oco oro Trancr	nitted as Check	red Below:		
	7	milea as oncon	Approved as Sub	mitted	Resubmit Copies for Approval
<u> </u>	For Approval For Your Use		Approved as Not		Submit Copies for Distribution
	I		Returned for Cor		Return Corrected Prints
X	As Requested		Issued for Const		Preliminary/Reference Only
	For Review a	na Comment	LIladded for contest		Prints Returned After Loan
_	7				Other
<u></u>	For Bids Due				
D.	omorleo:				
170	emarks:				
			**************************************		
		and the same of th			
-	A		nents please call Mark Sch	mitt on site	e at
	Any Questi	OOS OF COINI	Prior of 716 28/10/21	TO A STATE OF THE	_
			Crystal at 716-284-0431.	Sent B	ly: Rick Elia
	Сору То	•			
				Received B	y. Inferior of

# BACKFILL - Reach 5A, 1 & 2 during 2005

Delivery	Location	Delivered	Loads	Tons	Total	CY		Approved Backfill
Date		Ву			Tons		CY	Sample Number
8/5/2005	R5A	Lootens	24	500	500	333	333	
8/17/2005	R1	Lootens	19	485	984	323	656	
8/23/2005	R1	Lootens	94	1692	2676	1128	1784	
8/26/2005	R1	Lootens	110	2273	4949	1515	3299	
8/27/2005	R1	Lootens	68	1584	6533	1056	4355	Samples from BBLES
9/1/2005	R1	Lootens	89	1977	8510	1318	5673	Transmittal KC068
9/10/2005	R1	Lootens	8	144	8654	96	5769	correspond to 9073 cy
9/15/2005	R1	Lootens	28	504	9158	336	6105	of backfill
9/19/2006	R1	Lootens	2	42	9200	28	6133	
9/20/2005	R1	Lootens	106	2118	11318	1412	7545	-
9/28/2005	R1	Lootens	63	1419	12737	946	8491	
9/29/2005	R1	Lootens	41	873	13610	582	9073	
10/10/2005	R2	Lootens	91	1938	15548	1292	10365	Samples from BBLES
11/3/2005	R2	Lootens	74	1512	17060	1008	11373	Transmittal KC069
11/30/2005	R2	Lootens	113	2439	19499	1626	12999	correspond to 7074 cy
12/1/2005	R2	Lootens	122	2805	22304	1870	14869	of backfill
12/2/2005	R2	Lootens	84	1917	24221	1278	16147	

# TOPSOIL - Reach 5A, 1, & 2 during 2005

Delivery Date	Location	Delivered By	Loads	Tons	Total Tons	CY	Total CY	Approved Backfill Sample Number	
8/5/2005	R5A	Lootens	19	374	374	249	249	Samples from BBLES	
8/17/2005	R5A	Lootens	24	612	986	408	657	Transmittal KC068 correspond to 657 cy of	
8/18/2005	R5A	Lootens	4	0	986	0	657	topsoil	
12/7/2005	R1/R2	Lootens	98	2064	3050	1376	2033		
12/8/2006	R1/R2	Lootens	128	2679	5729	1786	3819	Samples from BBLES Transmittal KC069	
12/10/2006	R1/R2	Lootens	83	1250	6978	833	4652	correspond to 5595 cy	
12/13/2005	R1/R2	Lootens	88	1754	8732	1169	5821	of topsoil	
12/16/2005	R1/R2	Lootens	33	647	9378	431	6252		

ENVIRONMENTAL SERVICES, INC.

Remedial Action • Management and Construction

# Transmittal

KC 068

			KC 000					
Tran	smitted via H	and Delivery	BBL Environmental Services, Inc. 800 Weyrauch St., West Chicago, IL 60185 Field Office No. :(630) 293-7695					
To:	Mark Krip Tronox LI 800 Weyr West Chic		Date: March 30, 2006  File: 71014.002  Kress Creek Remedial Action, Reach 5A  West Chicago, IL					
	are sending y	drawi	ngs					
If m	aterial receive Quantity	ed is not as listed Identifying Numbers#	d, please notify us at once. Title	Action*				
	1	Sec 02200 2.1 C	Backfill Test RAD Report-Clay, Fill, River Rock	1				
	1	Sec 02200 2.1 C	Backfill Test Sieve Report-Clay & Fill	I				
	1	Sec 02200 2.1 C	Backfill Test Analytical Report (RCRA HAZ Characteristics) Clay					
	N/A	Sec 02200 1.6 C	Backfill Material Source (See Comments Below)	1				
	ction letter cod	S - resu	bmit J - rejected Y - for your approval					
Co 60	185		& Clay Backfill is Art Lootens & Son Inc.0S551 Joliet Rd. West Chic er Rock Backfill is Earth Inc. 455 West Bartlett Rd. Bartlett IL 60103	ago IL				
Sir	ncerely,							
Mi			u defi					
	TC/mfo		cc: Mark Schmitt, Sevenson					

MFS/mfs Enclosures Kerr-McGee Gamma Report

#### Generated 14-JUL-2005 13:26:33

Configuration : DKA200:[GAMMA.SCUSR.ARCHIVE]SMP_RIVERROCK071405_GE1_FVSU_88092.CNF;1

---- Sample Information ----

Sample Title : River Rock Earth Inc. Bartlett

: riverrock071405 Sample Quantity : 1.61000E+03 gram Sample ID Sample Type

Sample Geometry : : Dry weight

Spctrm Collector : ROB MADDOX Sample Number : 88092

Analyzed By

---- Sample Decay/Count Information ----

: 14-JUL-2005 00:00:00 Acquisition date : 14-JUL-2005 12:41:17 Sample Date

Decay time : 0 12:41:17.34 % dead time : 0.0%

Elapsed real time: 0 00:45:00.68 Elapsed live time: 0 00:45:00.00

---- Detector Parameters ----

Energy cal. time : 9-FEB-2005 11:15:05. Energy cal. oper.: RAY LANCASTER

Detector name : GE1 Counting geometry: FVSU

Effic. cal. time : 9-FEB-2005 13:19:57. Effic. cal. oper.: RAY LANCASTER

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/gram)	Act error	MDA (pCi/gram)	MDA error	Act/MDA
K - 40	4.682E+00	6.711E-01	7.018E-02	7.194E-03	66.713
RA-226	1.778E-01	3.067E-02	7.096E-02	1.101E-02	2.505
U-238	3.176E-01	2.130E-01	3.184E-01	3.996E-02	0.997

### ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K (pCi/gram) I		Act error	MDA (pCi/gram)	MDA error	Act/MDA
TH-232	1.438E-01	+	1.101E-01	1.201E-01	1.189E-02	1.197

# **Sewage Treatment Plant Samples**

Date Samples Recieved: 10/15/04

Backfill Verification Looten's Chay (Offsite Borkow Source)
Dry Weight

Dry vveight	I		T				Total	Total
Sample	U-238	+/-	Th-232	+/-	Ra-226	+/-	Uranium	Radium
Location	in pCi/g							
WWTP-OS-101504-BF-2	1.1	0.5	0.8	0.2	0.8	0.1	2.2	1.6
	< 1.0	na	0.7	0.1	0.5	0.1	< 2.0	1.3

All samples counted for 30 minutes

r-McGee Gamma Report

figuration : DKA200:(GAMMA.SCUSR.ARCHIVE)SMP_BF2_GE1_FVSU_87781.CNF;1

---- Sample Information ----

ple Title : WWTP-OS-101504

ple ID

: BF-2 Sample Quantity : 1.30800E+03 gram

: Dry weight Sample Geometry :

ple Type ple Number : 87781 Spctrm Collector : RAY LANCASTER

lyzed By

---- Sample Decay/Count Information ----

: 15-OCT-2004 00:00:00 Acquisition date : 15-OCT-2004 10:49:27 ple Date

ay time : 0 10:49:27.83 % dead time : 0.1%

osed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:01.13

---- Detector Parameters ----

rgy cal. time : 21-JAN-2004 15:04:57 Energy cal. oper.: RAY LANCASTER

ector name : GE1 Counting geometry: FVSU

ic. cal. time : 13-AUG-2004 10:37:00 Effic. cal. oper.: RAY LANCASTER

pined Activity-MDA Report

### Identified Nuclides ----

	Activity	Act error	MDA	MDA error	Act/MDA
.ide	(pCi/gram)		(pCi/gram)		
)	1.996E+01	2.464E+00	4.031E-01	4.183E-02	49.516
!26	8.428E-01	9.697E-02	1.662E-01	2.567E-02	5.071
18	1.071E+00	5.093E-01	7.577E-01	8.695E-02	1.413

#### Non-Identified Nuclides ----

ide	Key-Line Activity K.L. (pCi/gram) Ided		MDA (pCi/gram)	MDA error	Act/MDA
:32	7.594E-01 +	2.184E-01	3.172E-01	3.112E-02	2.394

iguration : DKA200:[GAMMA.SCUSR.ARCHIVE]SMP_BF2QC_GE2_FVSU_87782.CNF;1

---- Sample Information ----

ole Title : WWTP-OS-101504

: BF-2QC ole ID

Sample Quantity : 1.24100E+03 gram

Sample Geometry : : Dry weight ole Type

Spctrm Collector : RAY LANCASTER : 87782 ole Number

Lyzed By

---- Sample Decay/Count Information ----

ole Date : 15-OCT-2004 00:00:00 Acquisition date : 15-OCT-2004 10:50:40 ay time : 0 10:50:40.91 % dead time : 0.2%

Elapsed real time: 0 00:30:04.00 osed live time: 0 00:30:00.00

---- Detector Parameters ----

rgy cal. time : 22-JAN-2004 15:27:37 Energy cal. oper.: RAY LANCASTER

actor name : GE2 Counting geometry: FVSU

ic. cal. time: 13-AUG-2004 11:40:08 Effic. cal. oper.: RAY LANCASTER

oined Activity-MDA Report

- Identified Nuclides ----

	Activity	Act error	MDA (pCi/gram)	MDA error	Act/MDA
lide	(pCi/gram)		(2027) 32		
0	1.385E+01	1.787E+00	3.205E-01	3.308E-02	43.229
0		7.869E-02	1.848E-01	2.784E-02	2.881
226	5.326E-01			* <==== 00	4.326
232	7.302E-01	1.355E-01	1.688E-01	1.653E-02	
20	6 870E-01	4.971E-01	9.598E-01	1.151E-01	0.716

Reviewed

Date:

**Sewage Treatment Plant Samples** 

File#KC 4,2-1 STP 6,3

Date Samples Recieved: 10/15/04 ALFILL

Looten's Black Dirt (OFFsite Borrow Source)

Backfill Verification

Dry Weight								
							Total	Total
Sample	U-238	+/-	Th-232	+/-	Ra-226	+/-	Uranium	Radium
Location	in pCi/g	in pÇi/g						
WWTP-0S-101504-BF-1	0.5	0,3	0.7	. 0.1	0.5	0.1	1.0	1.1
WWTP-0S-101504-BF-1QC	0.9	0.5	0.9	0.2	0.9	0.1	1.9	1.7

All samples counted for 30 minutes

Kerr-McGee Gamma Report

Configuration : DKA200: [GAMMA.SCUSR.ARCHIVE] SMP_BF1_GE1_FVSU_87779.CNF;1

---- Sample Information ----

: WWTP-OS-101504 Sample Title

ample ID

Sample Quantity : 1.88700E+03 gram : BF-1

ample Type : Dry weight Sample Geometry :

: 87779 ample Number

Spctrm Collector : RAY LANCASTER

malyzed By

---- Sample Decay/Count Information ----

: 15-OCT-2004 00:00:00 Acquisition date : 15-OCT-2004 10:18:23 ample Date

ecay time : 0 10:18:23.07 % dead time : 0.1%

lapsed live time: 0 00:30:00.00

Elapsed real time: 0 00:30:00.97

---- Detector Parameters ----

nergy cal. time : 21-JAN-2004 15:04:57 Energy cal. oper.: RAY LANCASTER

etector name : GE1 Counting geometry: FVSU

ffic. cal. time : 13-AUG-2004 10:37:00 Effic. cal. oper.: RAY LANCASTER

ombined Activity-MDA Report

### --- Identified Nuclides ----

Activity		Act error	Act error MDA		Act/MDA
ıclide	(pCi/gram)		(pCi/gram)		
40	1.020E+01	1.356E+00	2.870E-01	2.979E-02	35.528
1-226	4.548E-01	`5.525E-02	1.018E-01	1.572E-02	4.470
I-232	6.827E-01	1.067E-01	8.212E-02	8.057E-03	8.314
238	5.086E-01	2.893E-01	4.504E-01	5.168E-02	1.129

:rr-McGee Gamma Report

Generated 15-OCT-2004 12:09:01

nfiguration : DKA200:[GAMMA.SCUSR.ARCHIVE]SMP_BF1QC_GE1_FVSU_87783.CNF;1

---- Sample Information ----

umple Title : WWTP-OS-101504

imple ID : BF-1QC

Sample Quantity : 1.15000E+03 gram

umple Type : Dry weight Sample Geometry :

Spctrm Collector : RAY LANCASTER imple Number : 87783

alyzed By

---- Sample Decay/Count Information ----

: 15-OCT-2004 00:00:00 Acquisition date : 15-OCT-2004 11:38:39 umple Date

cay time : 0 11:38:39.96 % dead time : 0.1%

apsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:01.05

---- Detector Parameters ----

tergy cal. time : 21-JAN-2004 15:04:57 Energy cal. oper.: RAY LANCASTER

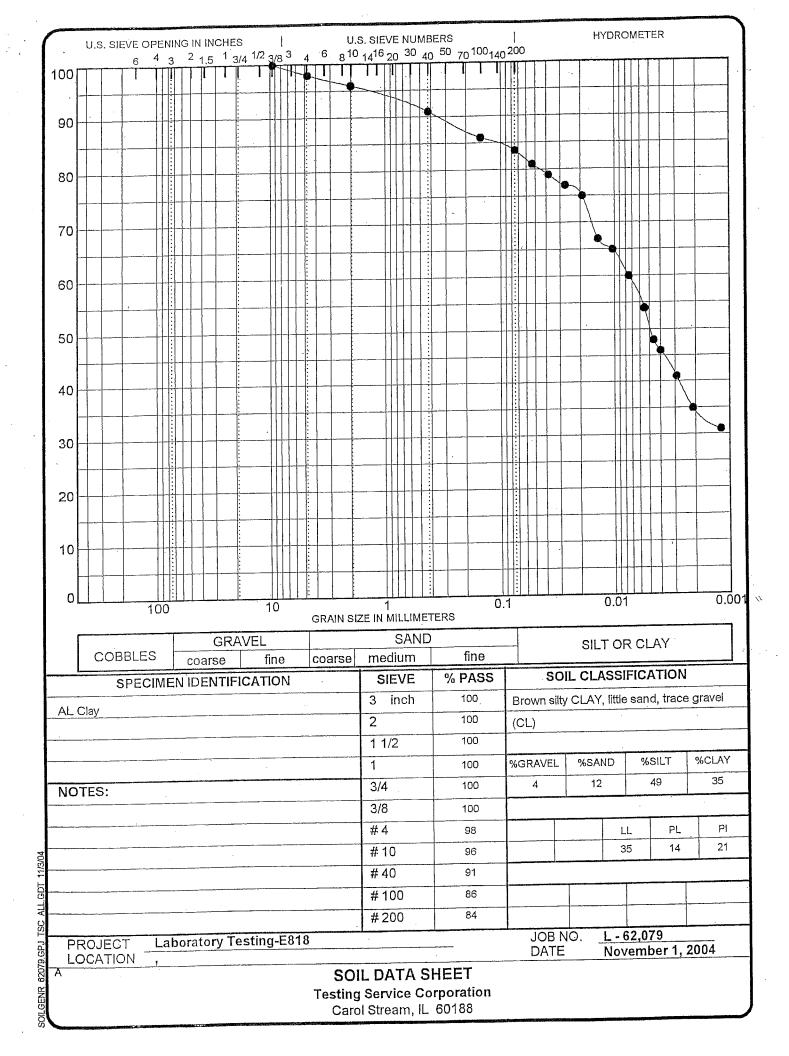
Counting geometry: FVSU tector name : GE1

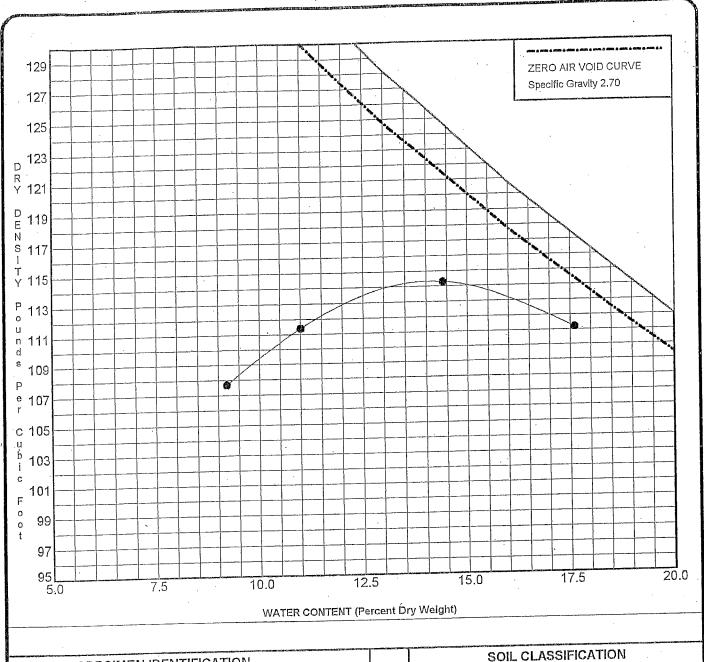
fic. cal. time : 13-AUG-2004 10:37:00 Effic. cal. oper.: RAY LANCASTER

mbined Activity-MDA Report

### -- Identified Nuclides ----

	Activity	Act error	MDA	MDA error	Act/MDA
ıclide	(pCi/gram)	(pCi/gram)			
4.0	2.058E+01	2.570E+00	4.322E-01	4.486E-02	47.623
.40		1.049E-01	1.803E-01	2.785E-02	4.810
1-226	8.674E-01		1.673E-01	1.642E-02	5.191
I-232	8.684E-01	1.704E-01			1.114
·238	9.257E-01	5.278E-01	8.308E-01	9.534E-02	1.11.





SPECIMEN IDENTIFICATION

AL Clay

Brown silty CLAY, little sand, trace gravel (CL)

MOISTURE/DENSITY RELATIONSHIP
X Standard ASTM D698/AASHTO T99
Modified ASTM D1557/AASHTO T180

Maximum Dry Density (PCF) 114.3

PROJECT LOCATION

Optimum Water Content (%)

Laboratory Testing-E818

14.1

JOB NO.

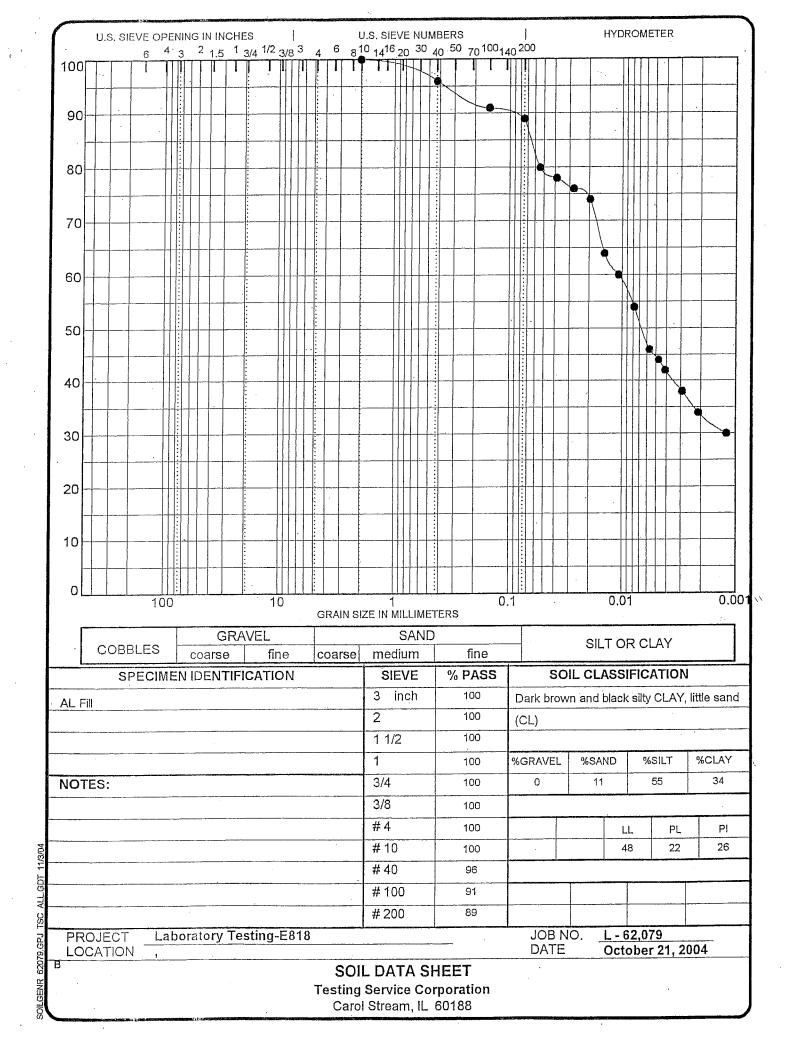
L - 62,079

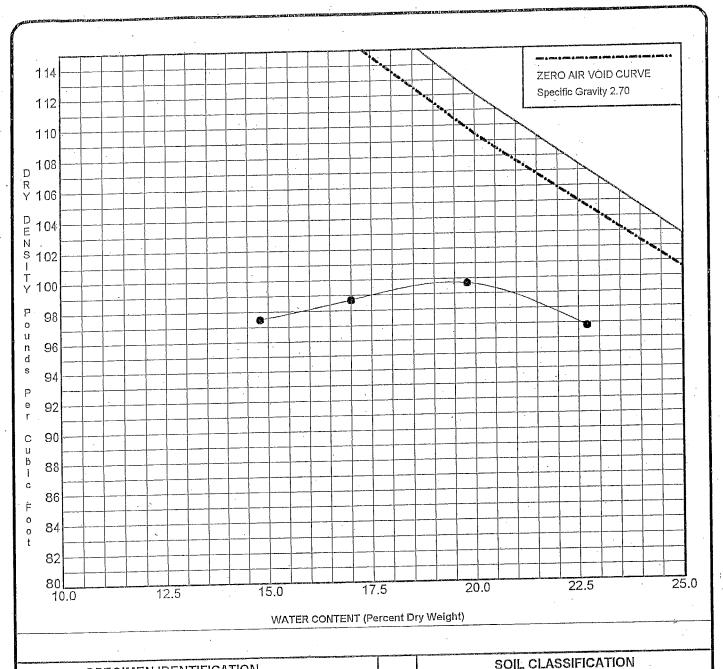
DATE

November 1, 2004

# MOISTURE-DENSITY RELATIONSHIP

Testing Service Corporation Carol Stream, IL 60188





SPECIMEN IDENTIFICATION Dark brown and black silty CLAY, little sand AL FIII (CL) NOTES: MOISTURE/DENSITY RELATIONSHIP Standard ASTM D698/AASHTO T99 X Modified ASTM D1557/AASHTO T180 99.8

19.4

Laboratory Testing-E818

Maximum Dry Density (PCF)

Optimum Water Content (%)

PROJECT

LOCATION B

MOISTURE-DENSITY RELATIONSHIP

JOB NO.

DATE

L - 62,079

October 21, 2004

**Testing Service Corporation** Carol Stream, IL 60188

# WASTE STREAM TECHNOLOGY, INC.

302 Grote Street Buffalo, NY 14207 (716) 876-5290

Analytical Data Report
Report Date: 10/29/04
Work Order Number: 4J20005

Prepared For Mike Crystal Sevenson Environmental Services 2749 Lockport Road Niagara Falls, NY 14302 Fax: (716) 285-4201

Site: Kerr Mcgee E818

Enclosed are the results of analyses for samples received by the laboratory on 10/20/04. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Brian S. Schepart, Ph.D., Laboratory Director

ENVIRONMENTAL LABORATORY ACCREDITATION CERTIFICATION NUMBERS NYSDOH ELAP #11179 NJDEPE #73977 PADEP #68757





2749 Lockport Road Nizgara Falls NY, 14302 Project: Kerr McGee

Project Number: Kerr Mogee E818 Project Manager: Mike Crystal Reported:

10/29/04 13:51

ANALYTICAL REPORT FOR SAMPLES

The second secon	Laboratory ID	Matrix	Date Sampled	Date Received	
Sample ID	-	To a 13	10/18/04 14:30	10/20/04 09:30	
ALFILL	4.720005-01	Soil	10/10/07 17:50		
ALCLAY	4J20005-02	Soil	10/18/04 14:35	10/20/04 09:30	

2749 Lockport Road Niagara Falls NY, 14302 Project: Kerr McGee

Project Number: Kerr Magee B818 Project Manager: Mike Crystal Reported: 10/29/04 13:51

# TCLP Metals by 6000/7000 Series Methods Waste Stream Technology Inc.

Analyte	Rosult	Reporting Limit	Unita	Dilution	Batch.	Proparod	Analyzed	Method	Notes
ALFILL (4J20005-01) Soil	Sampled: 10/18/04 14:30	Received: 1	0/20/04 0	9:30					
THE RESERVE THE PROPERTY OF THE PARTY OF THE	ND	0.001	mg/L	1	A)42712	10/27/04	10/28/04	EPA 7470A	
Mercury	ND	0,025	31	5	AJ42505	10/25/04	10/25/04	6010B	
Silver	ND	0.045	#	ĮĮ.	d	11	y	il	
Arsonic	·	0.045	К	4	n	le .	11	-d	
Barium	0.295		(i	ł	н	4	il.	ч	
Cadmium	ND	0.025	ţı	,,	11	ų	13	મ	
Chromhun	ND	0,025		,	li Ji	4	şk	71	
Lead	ďИ	0.075	q		"	-1	И	ય	
Selenium	ND	0,095	ŧt.	н	1,				
ALCLAY (4J20005-02) Soil	Sampled: 10/18/04 14:35	Received:	10/20/04	09:30				NAME OF THE OWNER	
NAME OF TAXABLE PARTY OF TAXABLE PARTY.	ND	0.001	mg/L	1	AJ42712	10/27/04	10/28/04	BPA 7470A	
Mercury	ND	0.025	11	5	AJ42505	10/25/04	10/25/04	6010B	
Silver	ND	0,045	IĮ.	11	ři –	ч	10/25/04	sy.	
Arsenic		0.025	Ji	и	п	r.	10/25/04	ıl	
Barium	0.508	0.025	н	(1	ŧ1	И	10/25/04	- U	
Cadmium	ND		4	ti	1(	11	и	IJ	
Chromium	ND	0.025		11	11	ď	и	μ	
Lead	ND	0.075	11		 11	. 11	11	IL	
Selenium	ND	0,095	61	11	"				

2749 Lockport Road Niagara Falls NY, 14302 Project: Ken McGee

Project Number: Kerr Meges E818 Project Manager: Mike Crystal Reported: 10/29/04 13:51

TCLP Volatile Organic Compounds by EPA Method 1311/8260B Waste Stream Technology Inc.

unalyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Sampled: 10/18/04 14:30	Received: 10	0/20/04 0	9:30				A	
nyl chloride	ND	10	ug/i	1,	AJ42503	10/25/04	10/25/04	8260	Į Į
nyt antartae J-dichloroethena	ND	10	μ	ţ)	59	B	N	a a	Ţ
-patemoreemens	ND	100	11	R	51	n	ję.	"	ī
aloroform	ND	10	ţı.	β	h	и,	и	,	,
arbon tetrachloride	ND	10	₩	ų	Ħ	*			. !
	ND	10	. #	ti	<b>{1</b>	ч	11 :		
enzene	ND	10	ħ	tı	n	4		11	!
,2-dichloroethane	ND	10	19	tl	11	Ų	H .	ii	1
ichloroethene	כות	10	u	и	þ	11	ST.	IJ	
rrachloroethene	ND	10	ti	n.	17	'†	Ч	il	
lloropenzene	ND	10	**	11	u .	d	n	μ	
4-dichlorobenzene		89.3 %	77	-718"	11	(1	η		
urrogate: 1,2-Dichloroethane	8-44	91.7%		-124	n	rr .	н	н	
urrogate: Toluene-d8		107%		.131	11	"	tı	Ħ	
urrogate: Bromofluorobenzer	76	11// /9	Q.D						
	Sampled: 10/18/04 14:3	5 Received:	10/20/04	09:30	rinchh	1 6 /2 E /6 A	10/25/01	8260	
LCLAY (4J20005-02) Soil	Sampled: 10/18/04 14:3 ND	10	ug/l	i	AJ42503	10/25/04	10/25/04	8260 *	
LCLAY (4J20005-02) Soil inyl chloride	Sampled: 16/18/04 14:3 ND ND	10 10	น <u>ศ</u> /1	1	11		10/25/04 a		ar aganganyan kabilat salam da
LCLAY (4J20005-02) Soil invl chloride	Sampled: 16/18/04 14:3 ND ND ND ND	10 10 100	น <u>ต</u> /l แ	1 11	u u	it	10/25/04 a a		and the second s
LCLAY (4J20005-02) Soil invl chloride 1-dichloroethene -butanone	Sampled: 16/18/04 14:3 ND ND ND ND ND	10 10 100 10	น <u>ศ</u> /1 ห ห	n n 1	16 U .	st Jt	10/25/04 a a a . s		ar agreement Laboration speciments
LCLAY (4J20005-02) Soil invl chloride ,1-dichlorocthene -butanone hloroform	Sampled: 10/18/04 14:3 ND ND ND ND ND ND ND	10 10 100 10 10	น <b>E/l</b> ห ห ห	1 11 11 11	i, ii ii .	sf  } - JI  }	at B So		
LCLAY (4J20005-02) Soil invl chloride 1-dichloroethene -butanone hlorofocus action tetrachloride	Sampled: 10/18/04 14:3  ND	10 10 100 10 10	น <b>E/l</b> ห ห ห ถ	1 11 11 11	н . Н п .	sf  E 	at B Si Ot		
LCLAY (4J20005-02) Soil inyl chloride 11-dichloroethene -butanone hloroform arbon tetrachloride enzene	Sampled: 10/18/04 14:3  ND	10 10 100 10 10	11 E/I H H H H	1 0 11 11 14	и ч ч ч ч	17  4   M   M   M   M	at 18 25 40 11	в П И И	
LCLAY (4J20005-02) Soil invl chloride 1-dichloroethene -butanone hioroform action tetrachloride enzene 2-dichloroethane	Sampled: 10/18/04 14:3  ND	10 100 100 10 10 10	11 E/1 H H H H H H	1 0 11 14 15 15	и ч ч ч о	е В Н Н Н	at B 5 Q U	в П И И	
inyl chloride .1-dichloroethene -butanone hloroform arbon tetrachloride enzene .2-dichloroethane richloroethene	Sampled: 10/18/04 14:3  ND	10 100 100 10 10 10 10	11 E/I H H H H	1 0 11 0 8 8 8	и п и и	17  4   M   M   M   M	a n n n n n n n n n n n n n n n n n n n	в П И И	
inyl chloride .1-dichloroethene -butanone hloroform arbon tetrachloride tenzene .2-dichloroethane richloroethene	Sampled: 10/18/04 14:3 ND	10 100 100 10 10 10	14 14 14 14 14 14 14 14 14 14 14 14 14 1	1 0 11 0 0 0 0 11 11 11	и в к у о о о о	е В Н Н Н	d	6 11 11 12 14 15 16 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18	
inyl chloride .1-dichloroethene -butanone hloroform arbon tetrachloride eenzene .2-dichloroethane richloroethene etrachloroethene	Sampled: 19/18/04 14:3 ND	10 100 100 10 10 10 10	14 E/I 14 H 15 H 16 H 17 H 18 H 18 H 18 H 18 H 18 H 18 H 18 H 18	1 0 11 0 8 8 8	и я г я я я я	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	a n n n n n n n n n n n n n n n n n n n	6 11 11 12 12 14 16 17 18 18	
inyl chloride .1-dichloroethene .butanone hloroform anchon tetrachloride tenzene .2-dichloroethane richloroethene etrachloroethene thlorobenzene .4-dichloroethene	Sampled: 16/18/04 14:3  ND	10 100 100 10 10 10 10 10 10	11 E/1 11 10 10 10 14 14 14	1 0 11 0 0 0 0 11 11 11	и в к у о о о о	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4 B B B B B B B B B B B B B B B B B B B	6 H H H H H H H H H H H H H H H H H H H	
LCLAY (4J20005-02) Soil inyl chloride .1-dichloroethene .butanone hlorofoun anchon tetrachloride tetrachloroethane richloroethene etrachloroethene thlorobenzene .4-dichloroethene .4-dichlorobenzene .4-dichlorobenzene .4-dichlorobenzene .4-dichlorobenzene .4-dichlorobenzene .4-dichlorobenzene .4-dichlorobenzene .4-dichlorobenzene .4-dichlorobenzene	Sampled: 16/18/04 14:3  ND	10 100 100 10 10 10 10 10	uE/I	1 0 11 0 0 0 0 11 11 11	и я г я я я я	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	d	6 11 11 12 12 14 16 17 18 18	

2749 Lockport Road

Niagara Falls NY, 14302

Project: Kerr McGee

Project Number: Kerr Mcgee E818

Project Manager: Mike Crystal

Reported: 10/29/04 13:51

# TCLP Pesticides by EPA Method 1311/8080A Waste Stream Technology Inc.

		1.7			٠,					
Analyte		Result	Reporting Limit	Units	Dilution	Batoh	Prepared	Analyzed	Method	Notes
ALFILL (4J20005-01) \$011	Sampled:	10/18/04 14:30	Received: I	0/20/04 0	9:30	The state of the s		-		
Gamma-BHC (Lindane)		ND	0.040	ug/l	1	AJ42215	10/22/04	10/26/04	8081	Ų
		ND	0.040	η	Ħ	ft.	II	18	"	Ų
Heptachlor		ND	0.040	В	ŧ1	н	þ	41	1/	U
Heptachlor Epoxide		ND	0.040	П	n	И	1'	Ð	11	L
Endrin		ND	0.040	ţŧ	В	19	11	u .	ч	U
Methoxychlor		ND	0.800	Ħ	H	ti	d	\$t	η	U
Chlordane		ND	1.00	и	· n	u	ч	**	4	Li .
Toxaphene			99.0 %	67.	723		···· ·· -	· · · · · · · · ·	11	
Surrogate: Tetrachloro-meta-	xyiene		110 %		132	ii .	11	"	"	
Surrogate: Decachlorobipher	<i>ו</i> יכָו		1117 20	, ພະ	100					
ALCLAY (4J20005-02) Soil	Sampled	l; 10/18/04 14:35	Roceived:	10/20/04	09:30					
		ND	0,040	ug/l	Ĭ	AJ42215	10/22/04	10/26/04	8031	U
Gamma-BHC (Lindauo)		ND	0,040	11	\$e	b .	0	ţı	d	U
Heptachlor		ND	0.040	4)	Я	15	ıl	u	16	U
Heptachlor Epoxide		מא	0.040	R	n	tr	, t	jı	II.	U
Endrin -			0.040	Ħ	U	Įi.	μ	11	В	υ
Methoxychlor		ND	0.800	15	ч	U	p	6-	η	U
Chlordane		ND		17	13	В .	А	Ð	я	ប
Toxaphene		סא	1.00		··· 743" · · ·	n		n		
Surrogate: Terrachloro-meta-	xylene		90.5 %		-723	"	17	li .	n	
Surrogate: Decachiorobipher	nyl		100 %	. 68	-132					

2749 Lockport Road Niagata Fails NY, 14302 Project: Korr McGee

Project Number: Kerr Megee E818

Reported: 10/29/04 13:51

Project Manager: Mike Crystal

# TCLP Herbicides by EPA Method 1311/8151A Waste Stream Technology Inc.

	•						THE PERSON NAMED OF PERSONS ASSESSED.	Market Street St	
Analyte	Result	Reporting Limit	Units	Dilution	Betch	Prepared	Analyzed	Method	Notes
ALFILL (4J20005-01) Soil	Sampled: 10/18/04 14:30	Received: 1	.0/20/04 C	9:30	A PARTY OF THE PAR		1 A 1 M 10 1	8151	11
2,4-D	dN dN	0.4 0.4	ug/l	1	AJ42708 "	10/27/04	10/27/04	B 1.7 1	Ü
2,4,5-TP (Silvex) Surrogate: 2,4-DCP.1A		101 %	24	146	·······································			ч	
ALCLAY (4J20005-02) Soll	Sampled: 10/18/04 14:35	Received:	10/20/04	09:30		-			
2,4-10	ND ND	0.4 0.4	ug/l	I "	AJ42708 "	10/27/04	10/27/04	8151	
2,4.5-TP (Silvex) Surrogate: 2,4-DCPAA	to some after and NS to provide management assessment consequence accompanies	34.0%	24	-146	и	<del></del>	и	,,	

2749 Lockport Road

Ningara Falls NY, 14302

Project: Kerr McGee

Project Number: Kerr Mcgee E818

Project Manager: Mike Crystal

Reported: 10/29/04 13:51

# TCLP Semivolatile Organic Compounds by EPA Method 1311/8270C Waste Stream Technology Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
ALFILL (4J20005-01) Soil	Sampled: 10/18/04 14:30	Received: 1	0/20/04 0	9:30		عفد بمردادها وروادها		04.00	
pyridine	ND	8	ug/l	1	AJ42123	19/21/04	10/22/04	R270	U U
1,4-dichlorobenzene	ND	8	17	ź1	И	Įl.		11	
Total cresols (o.m & p)	ND	24	11	44	P	tı	(i	11 U	()
hexachlorosthane	ДХ	8	ч	, Jr	н	4	li.	11	r L
nitrobenizane	ND	8	B	п	19	Ιξ	1/	11	u U
hexachlorobutadiene	ND	8	tt	H	1)	N	G		
2,4,6-trichlerophenol	מא	16	łl	16	ij	Ŋ	U	ti.	U
2,4,5-trichlerophenol	ND	. 8	¥f.	$\mu$	11	p	l)	ti tt	U
2,4-dinitrotoluene	ND	8	и	ıı	13	11	<b>t</b> +		Ü
hexachlorobenzene	ND	8	et	11	II	И	4	ч	U
pentachlorophenol	מא	16	н	Į:	II.	ıı	ć.	P	U
	manufacture of the second seco	29.6 %	77	-57		· ii · · - ·		Ti -	
Surrogate: 2-Fluorophenol		18.0%		-38	ji.	u	u	11	
Surrogate: Phenol-d6		58.5 %		106	"	rt	и	u	
Surrogate: Nitrobensene-d5		60.5 %		-105	Ħ	ìr	n	n	
Surrogate: 2-Fluorobiphenyl		72.6 %		-119	rr	u	,,,	•	
Surrogate: 2,4,6-Tribromoph	enol	75.0 %		-127	ĸ	11	$\eta$	и	
Surrogate: Terphenyl-d14		מא עוגעי	2.0	4 64 7					
ALCLAY (4J20005-02) Soil				09:30	maketa karpakta Citalian an takan	10 M 5 D 3	10/22/04	277()	Ū
THE RESIDENCE OF THE PROPERTY	ND	8	ug/l	1	AJ42123	10/21/04	10/22/04	8270	_
pyridine	ND ND	8 8	ug/l	1	α	10/21/04			Ų
pyridine 1,4-dichlorobenzene	ДИ СПИ СПИ	8 8 24	up/l "	] "	ti fi	d	н	11	ប ប
pyridine 1,4-dichlorobenzene Total cresols (0,m & p)	ND 0M 0M 0N 0N	8 8 24 8	ug/l " "	и и 1	tt fr 21	1) 1)	H H	11	ក ក ភ
pyridine 1,4-dichlorobenzene Total crosols (o,m & p) hexachloroethane	ND CM CM CM CM CM	8 8 24 8 8	ug/l " "	н п п	61 61 21 81	д я ч	Н Н П	11	ក ក ភ
pyridine 1,4-dichlorobenzene Total crosols (o,m & p) hexachloroethane nitrobenzene	ND 0M 0M 0N 0N	8 8 24 8 8	up/l n n n	1 11 14 14	tt 21 14 44	d 11 13 11 18	H H	11 15 16	ប ប ប ប
pyridine 1,4-dichlorobenzene Total cresols (e,m & p) hexachloroethane nitrobenzene hexachlorobutadiene	ND CM CM CM CM CM	8 8 24 8 8 8	ug/l e u u u	и и и п	11 15 21 81 44 45	d 11 15 11 13	Н И И И	H H O O	ນ ບ ບ ບ ບ
pyridine 1,4-dichlorobenzene Total cresols (e,m & p) hexachloroethane nitrobenzene hexachlorobutadiene 2,4,6-trichlorophenol	ND ND ND ND UN ND	8 8 24 8 8 8 16 8	u <b>g/</b> 1 n n n n n	1 v v v u	() () () () () () () () () () () () () (	1 11 11 11 11 14 14	П В В В В В	11 25 ft 10	ប ប ប ប ប
pyridine 1,4-dichlorobenzene Total cresols (e,m & p) hexachloroethane nitrobenzene hexachlorobutadiene 2,4,6-trichlorophenol 2,4,5-trichlorophenol	ND ND ND ND UN DN ND	8 8 24 8 8 8	ug/l e u u u	1 0 11 12 14 14 16 16 16 16 16 16 16 16 16 16 16 16 16	() () () () () () () () () () () () () (	d 11 11 11 11 11 11 11 11 11 11 11 11 11	П В В В В В В В	11 12 12 12 12 12 12 12 12 12 12 12 12 1	บ บ บ บ บ บ บ
pyridine 1,4-dichlorobenzene Total cresols (e,m & p) hexachloroethane nitrobenzene hexachlorobutadiene 2,4,6-trichlorophenol 2,4,5-trichlorophenol 2,4-dinifromiuene	ND ND ND ND ND ND ND	8 8 24 8 8 8 16 8	u <b>g/</b> 1 n n n n n	1 v v v u	() () () () () () () () () () () () () (	d 11 15 15 15 15 15 15 15 15 15 15 15 15	П В В В В В В В В В В В В В В В В В В В	11 12 14 14 14 14 14 14 14 14 14 14 14 14 14	บ บ บ บ บ บ บ บ
pyridine 1,4-dichlorobenzene Total cresols (e,m & p) hexachloroethane nitrobenzene hexachlorobutadiene 2,4,6-trichlorophenol 2,4-dinifrotoluene hexachlorobenzene	ND ND ND ND ND ND ND ND	8 8 24 8 8 8 16 8	น <b>ฏ/1</b> ห ห ห ห ห ห	1 0 11 12 14 14 16 16 16 16 16 16 16 16 16 16 16 16 16	() () () () () () () () () () () () () (	d 11 11 11 11 11 11 11 11 11 11 11 11 11	П В В В В В В В	11 12 12 12 12 12 12 12 12 12 12 12 12 1	บ บ บ บ บ บ บ
pyridine 1.4-dichlorobenzene Total cresols (e,m & p) hexachloroethane nitrobenzene hexachlorobutadiene 2.4,6-trichlorophenol 2.4-dinitrotoluene hexachlorobenzene pentachlorophenol	ND ND ND ND ND ND ND ND	8 8 24 8 8 8 16 8 8	ug/1 n n n n n n u u	1 1 10 10 10 10 10 10 10 10 10 10 10 10	() () () () () () () () () () () () () (	а 11 13 14 14 15 14 16	П В В В В В В В В В В	11 22 44 44 44 44 44 44 44 44 44 44 44 44	บ บ บ บ บ บ บ บ
pyridine 1.4-dichlorobenzene Total cresols (e,m & p) hexachloroethane nitrobenzene hexachlorobutadiene 2.4,6-trichlorophenol 2.4-dinitrotoluene hexachlorobenzene pentachlorophenol Surrogate: 2-Fluorophenol	ND ND ND ND ND ND ND ND	8 8 24 8 8 8 16 8 8	ug/l n n n n n n e n	1 v v v v u u u	() () () () () () () () () () () () () (	0 9 11 9 8 8 8 11 9	H H H H H H H H H H H H H H H H H H H	11 11 11 11 11 11 11 11 11 11 11 11 11	บ บ บ บ บ บ บ บ
pyridine 1.4-dichlorobenzene Total crosols (e,m & p) hexachloroethane nitrobenzene hexachlorobutadiene 2.4,6-trichlorophenol 2.4-dinitrotoluene hexachlorobenzene pentachlorophenol Surrogate: 2-Fluorophenol Surrogate: Phenol-d6	ND ND ND ND ND ND ND ND	8 8 24 8 8 16 8 8 8 16 29,2 %	ug/l n n n n n n n n n n n n n n n n n n n	1 0 0 0 0 0 0 0 0	tt	а 11 13 14 14 15 14 16	H  B  C  H	11 22 00 00 00 00 00 00 00 00 00 00 00 00	บ บ บ บ บ บ บ บ
pyridine 1,4-dichlorobenzene Total crosols (e,m & p) hexachloroethane nitrobenzene hexachlorobutadiene 2,4,6-trichlorophenol 2,4-dinitrotoluene hexachlorobenzene pentachlorophenol Surrogate: 2-Fluorophenol Surrogate: Phenol-d6 Surrogate: Nitrobenzene-d5	ND ND ND ND ND ND ND ND ND	8 8 24 8 8 16 8 8 17,1 % 67,8 %	ug/l n n n n n n n n n n n n n n n n n n n	1 "" "" "" "" "" "" "" "" ""	0 9 10 11 11 11 11 11 11 11 11	0 9 11 9 8 8 8 11 9	H  B  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H	11 22 00 00 00 00 00 00 00 00 00 00 00 00	บ บ บ บ บ บ บ บ
pyridine 1.4-dichlorobenzene Total crosols (e,m & p) hexachloroethane nitrobenzene hexachlorobutadiene 2.4,6-trichlorophenol 2.4-dinitrotoluene hexachlorobenzene pentachlorophenol Surrogate: 2-Fluorophenol Surrogate: Phenol-d6	ND ND ND ND ND ND ND ND ND	8 8 24 8 8 16 8 8 8 16 29,2 %	ug/l n n n n n n n n n n n n n n n n n n n	1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 9 8 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 10 10 10 10 10 10 10 10 10 10 10 10 10	H  B  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H  C  H	11 22 00 00 00 00 00 00 00 00 00 00 00 00	บ บ บ บ บ บ บ บ

2749 Lockport Road

Analyte

Niagara Falls NY, 14302

ALFILL (4J20005-01) Soil

Project: Kerr McGee

Project Number: Kerr Mcgee E818

Project Manager: Mike Crystal

Reported: 10/29/04 13:51

Notes

# Conventional Chemistry Parameters by ASTM Methods

Waste Stream Technology Inc. Reporting Method Analyzed Batch Prepared Limit Unita Dilution Rosult Sampled: 10/18/04 14:30 Received: 10/20/04 09:30 10/21/04 EPA 9045C AJ42104 10/21/04

Sampled: 10/18/04 14:35 Received: 10/20/04 09:30

ALCLAY (4J20005-02) Soll EPA 9045C 10/21/04 AJ42104 10/21/04 0.10 pH Units 8.26

0.10 pH Units

2749 Lockport Road

Project: Kerr McGee

Project Number: Kerr Mcgee E818 Project Manager: Mike Crystal

Reported: 10/29/04 13:51

Niagara Falls NY, 14302

# Physical Parameters by APHA/ASTM/EPA Methods Waste Stream Technology Inc.

								THE PERSON NAMED IN COLUMN 2 I	
Analyto	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Annlyzed	Method	Notes
ALFILL (4J20005-01) Soil	Sampled: 10/18/04 14:30	Received: I	0/20/04 0	9:30		PALENCHIA CONTRACTORIO	emercial and the second	170.4.1010	. y <del></del>
	>200		٥Ŀ	1	AJ42103	10/21/04	10/21/04	EPA 1010	
Ignitability by Flashpoint	ND	40.0	ពាន្ធ/៤ន្ត	н	AJ42106	10/21/04	10/22/04	Section 7.3.3.2	
Reactive Cyanide	· •	•	H 1111 <b>⊕</b> 11.26	41	AJ42107	10/21/04	10/25/04	Section 7.3.4.2	
Roactive Sulfide	NД	40.0	"		(F) 4.76 LO.	10(4170)			
ALCLAY (4J20005-02) Soil	Sampled: 10/18/04 14:35	Received:	10/20/04	09:30			property and the second of the		
	<b>&gt;</b> 200		or.	1	AJ42103	10/21/04	10/21/04	EPA 1010	
Ignitability by Flashpoint		40.0	-		AJ42106	10/21/04	10/22/04	Section 7.3.3.2	
Reactive Cyanide	ND	40.0	mg/kg		•	10/21/04	10/25/04	Section 7.3.4.2	
Reactive Sulfide	СТИ	40.0	(t	и	AJ42107	10/21/04	10/20/07	Degram (12:1)	

OCT.29.2004 1.34FF MHDIC DIMERITIES.

Sevenson Environmental Services 2749 Lockport Road

Ningara Palls NY, 14302

Project: Kert McGee

Project Number: Kerr Megee E818 Project Manager: Mike Crystal Reported: 10/29/04 13:51

### Notes and Definitions

U Analyte included in the analysis, but not detected

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference



### Appendix M

Forest Preserve Disturbed Acreage – Reach 5A



LEGEND:

LIMITS OF DISTURBANCE

FORESTED FOREST PRESERVE LAND

NON-FORESTED FOREST PRESERVE LAND

MITIGATED FORESTED FOREST PRESERVE LAND

MITIGATED NON-FORESTED FOREST PRESERVE LAND

FOREST PRESERVE LAND

NOTES: 1. AREAS SHOWN IN SQUARE FEET

2. AERIAL PHOTOS DOWNLOADED FROM THE ILLINOIS NATURAL RESOURCES GEOSPATIAL DATA CLEARINGHOUSE AT http://www.isgs.uiuc.edu/nsdihome/

250 500 Feet GRAPHIC SCALE

TRONOX LLC KRESS CREEK/WEST BRANCH DuPAGE RIVER SITE DISTURBED DCFP MEMORANDUM

# **REACH 5A**



**FIGURE**